

# MARINE REVIEW

VOL. XVIII.

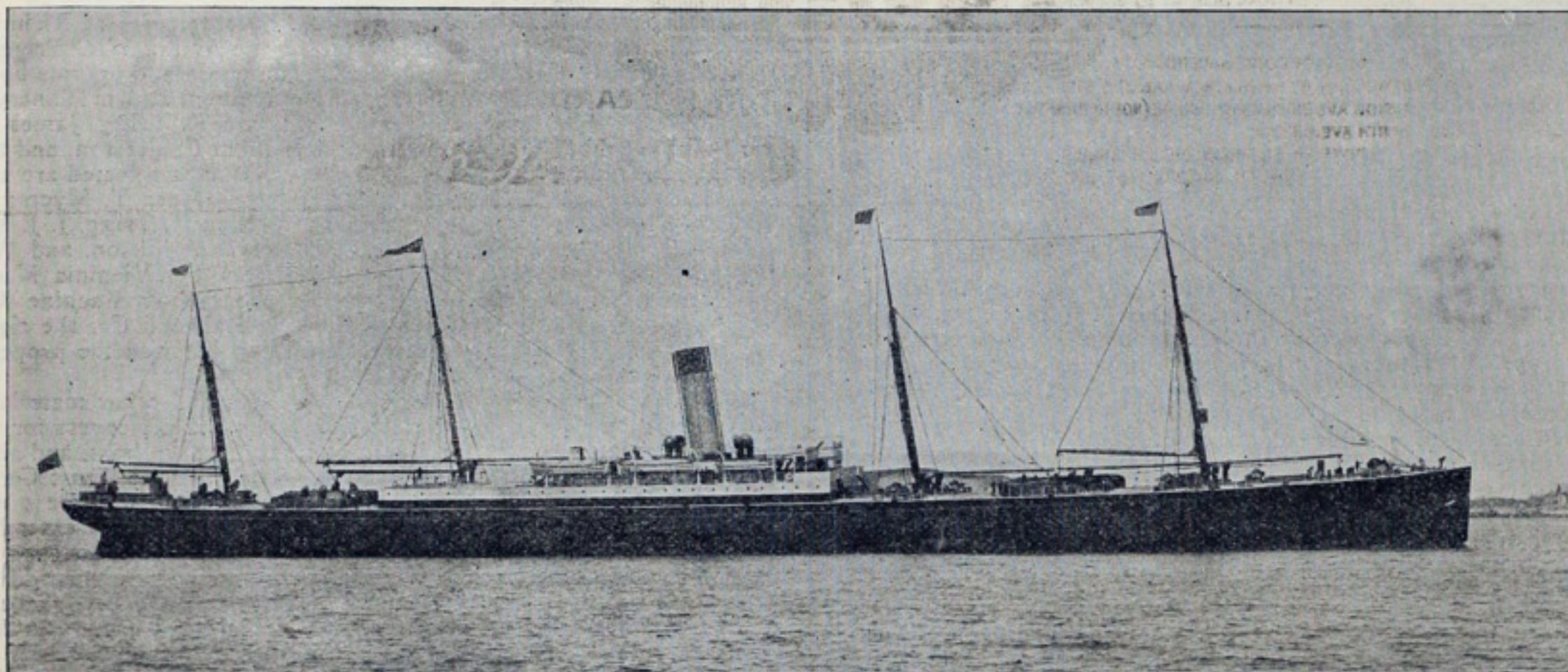
CLEVELAND, O., OCTOBER 20, 1898.

No. 15.

## LOSS OF THE MOHEGAN.

THE ATLANTIC TRANSPORT CO.'S STEAMER, FORMERLY THE CLEOPATRA OF THE WILSON & FURNESS-LEYLAND LINE, FOUNDERS NEAR THE LIZARD.

The British steamer Mohegan of the Atlantic Transport Co., formerly the Cleopatra of the Wilson & Furness-Leyland line, which was wrecked on Oct. 14, in the vicinity of the Lizard, is herewith pictured from a recent photograph. The heavy loss of life attending the foundering makes the accident one of the most unfortunate of the year. Details as to causes and the exact circumstances of the disaster are both meager and conflicting. The opinion was at first advanced that the machinery of the Mohegan became disabled, making it practically impossible to prevent her running ashore by reason of the heavy easterly gale which was blowing. According to the reports of survivors, the steamer began to settle by the head immediately after she struck. She struck with a grating sound, having been proceeding at full speed, and the engineers at first imagined that the sound was that of coal falling in the bunkers, but the first shock was speedily followed by a second, and in twenty minutes the vessel sank. The vessel struck forward on the starboard side, and when she sank the stern rose out of the water. The position of the wreck is, according to cable dispatches, a peculiar one, the bow being tilted high on the rocks, and the stack and masts, which rise above the water, tilted back to an angle of 15 degrees to the sea level. This position would tend to show that the steamer was heading almost directly away from the coast



ATLANTIC TRANSPORT CO.'S STEAMER MOHEGAN, FOUNDERED NEAR THE LIZARD OCT. 14.

endeavoring to regain the proper course when she struck. No satisfactory theory has yet been advanced as to why the vessel should have been off the course, or at least in such a position.

The Mohegan was a new vessel, having been launched within the year at the yard of the Earles at Hull, England, and arriving at New York on her maiden trip on August 12, last. She is a single-screw steel vessel of 4,510 tons register, 480 feet long by 52 feet beam and 36 feet depth of hold. She had accommodations for about 125 passengers and a capacity for between 7,000 and 8,000 tons of freight, in addition to 700 cattle. Her commander, Capt. Griffiths, was commodore of the Atlantic Transport fleet, and her officers were all picked men, which adds to the difficulty of explanation of the position of the vessel. The Mohegan was one of the five vessels recently purchased by the Atlantic Transport Co. from the Wilson & Furness-Leyland Line to replace the Mohawk, Mobile, Massachusetts, Michigan and Mississippi, which were sold to the United States government for use as transports. The other four purchased by the Atlantic company are the Manitou, Marquette, Menominee and Mesabi, formerly bearing the names Victoria, Boadicea, Alexandria and Winifreda.

As is frequently the case under such circumstances, numerous derogatory stories have been in circulation with reference to the condition of the wrecked steamer. It was alleged that the one voyage which she made out and home developed the fact that her engines were defective and that her boilers leaked. For two weeks previous to sailing on her last trip, the Mohegan had been in dry dock undergoing repairs, and it is claimed from some sources that the result of a twenty-four-hour trial trip which followed the completion of this work was unsatisfactory. The officials of the Atlantic Transport Co. stoutly deny that her boilers were defective or that her condition was not satisfactory, and they express the firmest conviction that the accident could not have been due to any defect of boilers or machinery.

In an interview recently printed in a New York paper Prof. Angell, ex-minister to Turkey, is quoted as saying that the sultan told him that he hoped to be able to place an order for several war vessels with American ship builders.

## GREAT DEMANDS FOR SHIP PLATE.

UNUSUAL ACTIVITY IN SHIP YARDS CROWDING THE PLATE MANUFACTURERS—THE BOOM IN LAKE FREIGHTS.

This country has never seen a more active condition of business, as far as ship builders and ship owners are concerned, than prevails at the present time. More new ship yard projects are under way on the Atlantic coast than at any time within the past ten years. The same is true of improvements being made in the yards already established. This condition on the coast is due in part to the recent extensive naval orders for battle-ships, monitors and torpedo boats, but the number of new merchant ships under construction—many of them to replace vessels taken into the auxiliary navy by the government—is also very large. A similar condition of affairs exists throughout Great Britain and in Germany, and it is understood that one leading steel company here has foreign orders for 50,000 tons of ship plate, in addition to the very heavy home orders already placed or in sight.

It is certain that the plate mills of the country are to be taxed to their fullest capacity on ship plate, and the builders of the lakes, who will undoubtedly have orders to place soon for material, may find that the question of supplies from the plate mills will be the principal problem with them. As yet lake vessel owners are slow in placing orders for new ships, notwithstanding the conditions as to material and the probability that all the ship builders will be comfortably supplied with business. The

Craig Ship Building Co. of Toledo has about decided to put down, on its own account, a steel vessel of Welland canal dimensions, suited to the Chicago-Montreal trade. Other builders are all figuring, but it cannot be learned that any additional orders have been closed.

Lake freights are still advancing, the rate on wheat from the head of Lake Superior to Buffalo having reached  $3\frac{1}{4}$  to  $3\frac{1}{2}$  cents, while ore shippers find themselves unable to secure vessels at \$1 a ton from Duluth and Ashland. These advances will cut down the ore output for the season to little more than 13,000,000 tons, unless a slump should occur in grain freights. The boom in freights has brought some strange conditions. On one contract covering the delivery of 90,000 tons of ore from Escanaba, 80 cents was paid for three vessels, a few days ago, although the ore was taken in the first place at 40 cents and was all to have been moved before Sept. 15 last. The number of vessels still carrying ore on 60-cent contracts, some of them made as late as the 15th of August, is very large, although better than a dollar could undoubtedly be secured now on quite a large amount of tonnage.

Discussion engendered by the recent visit to this country of Messrs. White and Bates, English underwriters, has brought out the fact that about fifteen years ago the total of marine insurance in the United States was about \$2,000,000,000. For this the companies received in premiums about \$17,500,000, the average rate being 90 cents. Last year the sum insured was about \$4,000,000,000, the companies receiving about \$16,000,000 in premiums, at an average rate of about 45 cents. Since 1862, eleven New York companies have retired, six going out of business since 1876, the year when the first foreign company started in that territory.

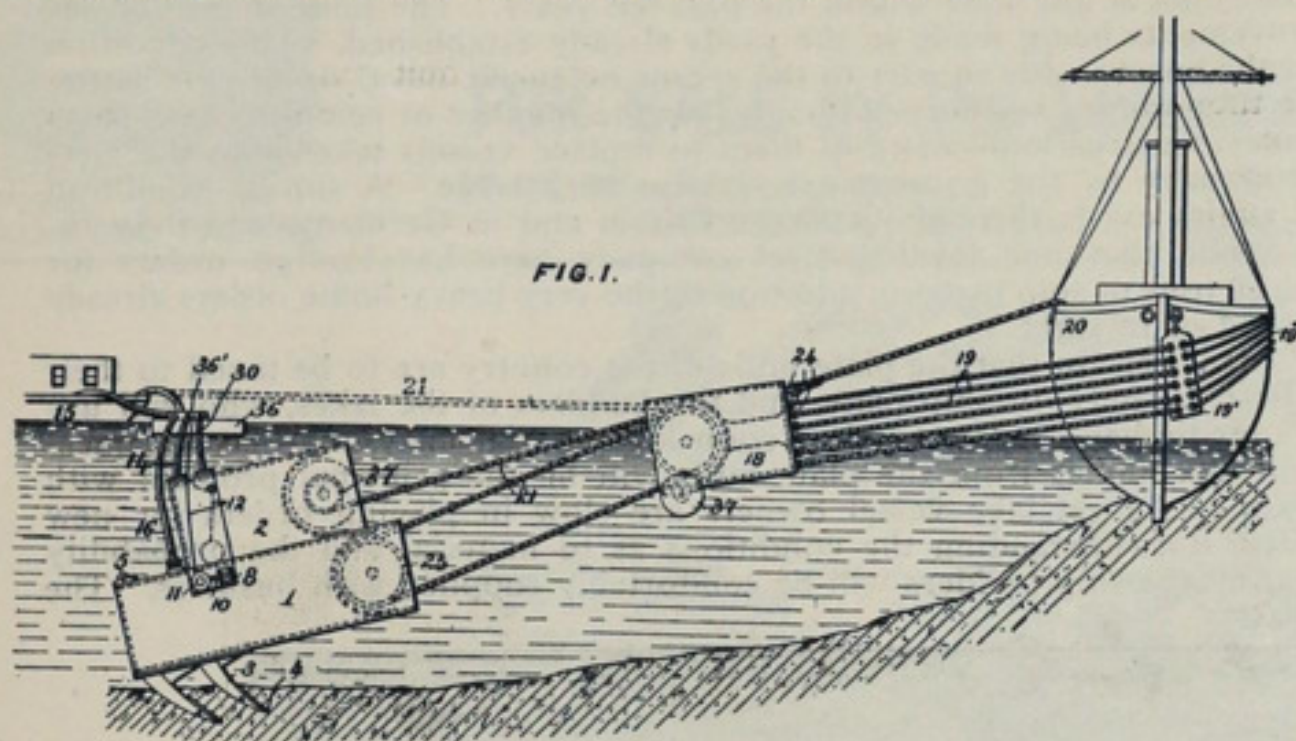
Another order for a Howden hot draft equipment has been secured by the Dry Dock Engine Works of Detroit. The steamer is the John F. Eddy. The draft will be installed in connection with a new boiler. It is more than probable that owners of a large number of vessels of the Eddy's kind will see the advantage of taking up this question of artificial draft, now that there is a certainty of profitable business for this class of ships for some time to come.



## FOR FLOATING STRANDED VESSELS.

A PATENT APPARATUS DEvised BY SIMON LAKE, INVENTOR OF THE SUBMARINE BOAT ARGONAUT.

Simon Lake of Baltimore, Md., who has attained some degree of prominence in shipping circles as the inventor of the submarine boat Argonaut, was granted letters patent, a short time ago, on an apparatus for floating stranded vessels. In the specifications upon which this patent was granted, Mr. Lake goes into the subject of the release of stranded vessels at some length. Taking up the method of the release of vessels by means of towing vessels, he asserts that, owing to the excessive power required for such an operation and the comparatively small force to be derived from the means of propulsion of the towing vessel, the difficulty is enhanced, to say nothing of the liability to disastrous effects from the delay in waiting for favorable tides and conditions of weather. As evidence of the comparatively small amount of power available for such work, he points out that the forward impulse of a large transatlantic liner,

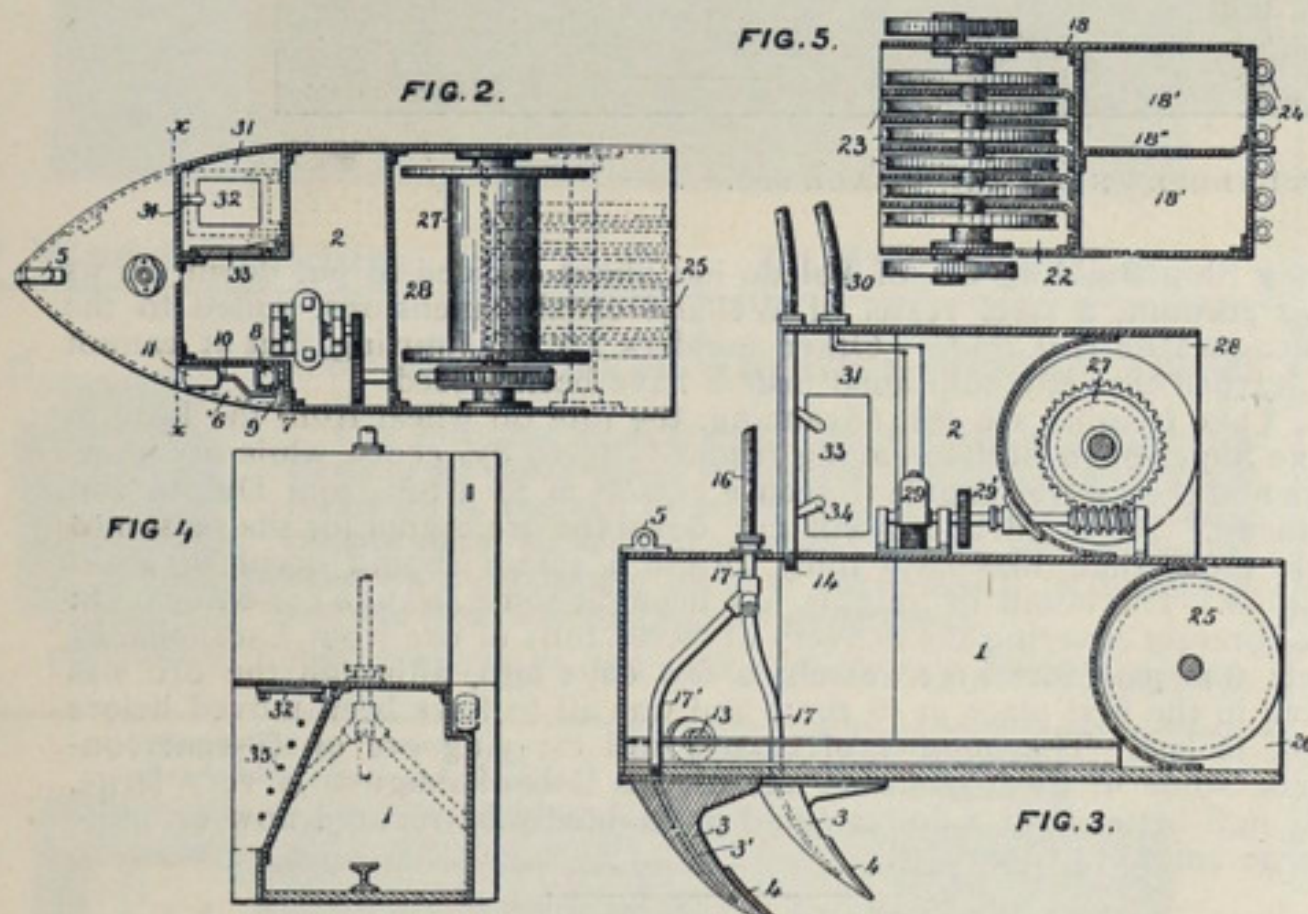


SIMON LAKE'S INVENTION FOR FLOATING STRANDED VESSELS.

such, for instance, as the St. Paul of the American line, developing 20,000 horse power, is only about 85 tons, while that of the larger tug boats is not more than 3 or 4 tons.

The inventor makes the claim that although the power developed by the engines of wrecking vessels is ample for performing the object of his invention, a means of applying such power effectively has heretofore been lacking, the mere resistance of the water against the propeller wheels being insufficient. He also cites that the employment of anchors of the ordinary type, from which lines have been led to winches on the stranded vessel, has proven ineffective, by reason of the fact that they have necessarily been of such size as to be readily handled, in which case their grasp upon the sea bed has failed to offer sufficient resistance to the strain leading from the stranded vessel.

The immediate object of the present invention, Mr. Lake claims, is to obviate these objections and furnish an abutment of sufficient rigidity to resist the pull of the line made fast to the vessel for purposes of dislodgment. It consists, primarily, of a normally buoyant anchor, adapted



DETAILS OF THE INVENTION OF SIMON LAKE OF BALTIMORE.

to be towed to the vicinity of the stranded vessel and provided with means for then destroying its buoyancy to enable it to sink to the sea bed, where its weight operates in embedding its arms deeply in the bottom to secure a firm hold. It is claimed that a line attached to the anchor under such conditions may be subjected to the severest strain without starting the same from its position. The restoration of the buoyancy of the anchor enables it to again rise to the surface.

The anchor being provided with a water-tight chamber capable of excluding the water when normally floating upon the surface, its bulk and weight will not appreciably affect its adaptability for transportation. The body of the anchor is shaped somewhat like a boat, pointed at both ends, in order that it may be readily drawn by a towboat or a wrecking steamer provided with such supplemental apparatus as may be found necessary. While the largest anchors at present in use weigh only 3 or 4 tons, and cannot be made larger in practice because of the difficulty of

handling them from the deck of the ordinary wrecking steamer, anchors made according to Mr. Lake's invention may be of 50 or 75 tons in weight and capable of resisting a pull of from 500 to 600 tons from lines attached to the stranded vessel. The invention includes a winch mounted in an external recess on the body of the anchor and driven by a motor within a water-tight chamber, and thus adapted to apply directly to the line the power for moving the stranded vessel. The invention also includes a floating pulley-block with pulleys for use in connection with the winch in the anchor and line therefrom, the pulley-block being connected by other lines to a head block attached to the vessel. The latter arrangement enables the employment of a series of hemp ropes between the head block and the floating pulley block to give the requisite elasticity to the tackle, while employing a steel cable for connecting the pulley block and the anchor. By this construction the cable may be normally wound up so as to draw the pulley block up against the end of the anchor to serve as the stern of a boat, which they together produce of convenience form for towing.

According to the representations of the inventor the important advantage of the present improvement is that the apparatus may be attached to the stranded vessel immediately upon arrival in the vicinity and without waiting for favorable tides and weather, and indeed it is claimed that by connecting the hauling line to a winch directly upon the stranded vessel the work of floating her may be effected even in stormy weather. In the accompanying drawings figure 1 is a diagrammatic representation of the apparatus in the operation of dislodging a stranded vessel; figure 2 is a plan of the anchor with the top portion removed to expose the construction and arrangement of the parts below; figure 3 is a vertical section of same; figure 4 is an end elevation, partly in section, and figure 5 is a sectional plan of the floating pulley block.

## RICHMOND SHIP BUILDING PLANT.

THE WILLIAM R. TRIGG CO. IS INCORPORATED AND CONTRACTS ARE AWARDED FOR THE BUILDINGS AND MACHINERY NECESSARY FOR A MODERN YARD.

Incorporation of the new ship building enterprise at Richmond, Va., was made last week under the name of the William R. Trigg Co., the avowed object of which is "to construct, maintain and operate boats, ships, docks, ship yards, railroad and marine equipment and machinery of every description." The incorporators are William R. Trigg, James N. Boyd, Virginius Newton, J. J. Montague and William C. Preston, and the capital stock is divided into shares of \$100 each. Officers selected are as follows: President, William R. Trigg; vice president, Lilburn T. Myers; secretary, William C. Preston; board of directors, William R. Trigg, J. J. Montague, Lilburn T. Myers, Robert S. Boshier, Thomas Atkinson, and William C. Preston. The new company has leased from the Virginia Machine Co. for a number of years the plant known as the Talbott Machine Works and has secured from the Chesapeake & Ohio Railroad Co. the right to use the dock and the land adjacent thereto, lying between the property above mentioned and the James river.

Contracts have been let for all the plates and other materials needed for the construction of the five torpedo boats and destroyers for which the government has awarded the Trigg company the contract, and also for the buildings and machinery for the plant. The Virginia Trust Co. is surety for the ship building company in its transactions with the government. The launching ways will be of the latest pattern and will extend over 600 feet. The company will at present make no effort to deepen the river channel in the immediate vicinity of the new yard. The torpedo boats and destroyers will draw but 6½ feet, while the water at the dock has a depth of 14 feet. The citizens of Richmond will, however, take up the matter of better harbor facilities, as well as the question of deeper draft down the river. Figuring the distance from Richmond to the capes as 127 miles, it is found that 82 per cent of that distance has the requisite depth of 22 feet at mean low tide, and vessels drawing 19½ feet of water can now come within 10 miles of Richmond, while those drawing 16 feet can reach the city wharves. The improvements mapped out contemplate a uniform depth of 22 feet. It is now estimated that not more than six weeks will be required to get the Richmond ship building plant in order, and that work will be in progress by December 1 at the latest. The method in vogue on the great lakes of launching boats sideways will be followed at the new yard.

## Improvements at the Works of the Union Dry Dock Co.

With reference to improvements soon to be made at the plant of the Union Dry Dock Co., Buffalo, Superintendent Edward Gaskin writes the Review as follows: "The improvements which we contemplate in our plant consist principally of the enlargement of our punch shed and machine shop to about twice its present capacity, providing for electric and pneumatic tools of the newest pattern, which, with our new electric crane, just furnished by the Wellman-Seaver Engineering Co. of Cleveland, and our enlarged dry dock, capable of taking care of the largest vessels now afloat on the lakes, ought to make our plant equal to any on the chain of lakes for the work that is likely to come to us."

It is stated that the new machine shop, above referred to, will be 110 by 400 feet in size and will be completed by Jan. 1. Mr. Gaskin sizes up the situation very sensibly in the following remark: "At the small profit obtainable in the business, the firm that expects to compete successfully must have a plant that is up to date in every particular. Every tool used must be selected with an eye to its effectiveness, and every bit of machinery must be so designed as to present the highest standard of efficiency with a minimum of expense required in its operation. It is said that the entire outlay for improvements at the Union works this year will aggregate more than \$200,000."

The completeness of preparations made by the navy department during the recent war have been in no way more conclusively proven than by the immense stock of Mediterranean charts provided in anticipation of the visit of Commodore Watson's fleet to the Spanish coast. At Gibraltar alone over \$10,000 worth of charts owned by the United States government are stored.



## OUR MERCHANT SHIPPING.

COMPLETE RETURNS MADE TO THE BUREAU OF NAVIGATION—EFFECT OF HIGH PREMIUMS DEMANDED BY UNDERWRITERS DURING THE WAR.

Washington, D. C., Oct. 18.—Complete returns to the bureau of navigation, treasury department, show that the documented American merchant shipping on June 30, 1898, comprised 22,705 vessels of 4,749,738 gross tons, compared with 22,633 vessels of 4,769,020 tons on the like date in 1897. The decrease of 19,282 tons is more apparent than real, as 11,000 tons of this amount is due to dropping fractions of tonnage in the accounts, and 66,713 tons were sold to the navy and war departments to carry troops, supplies and provisions, and have merely changed employers.

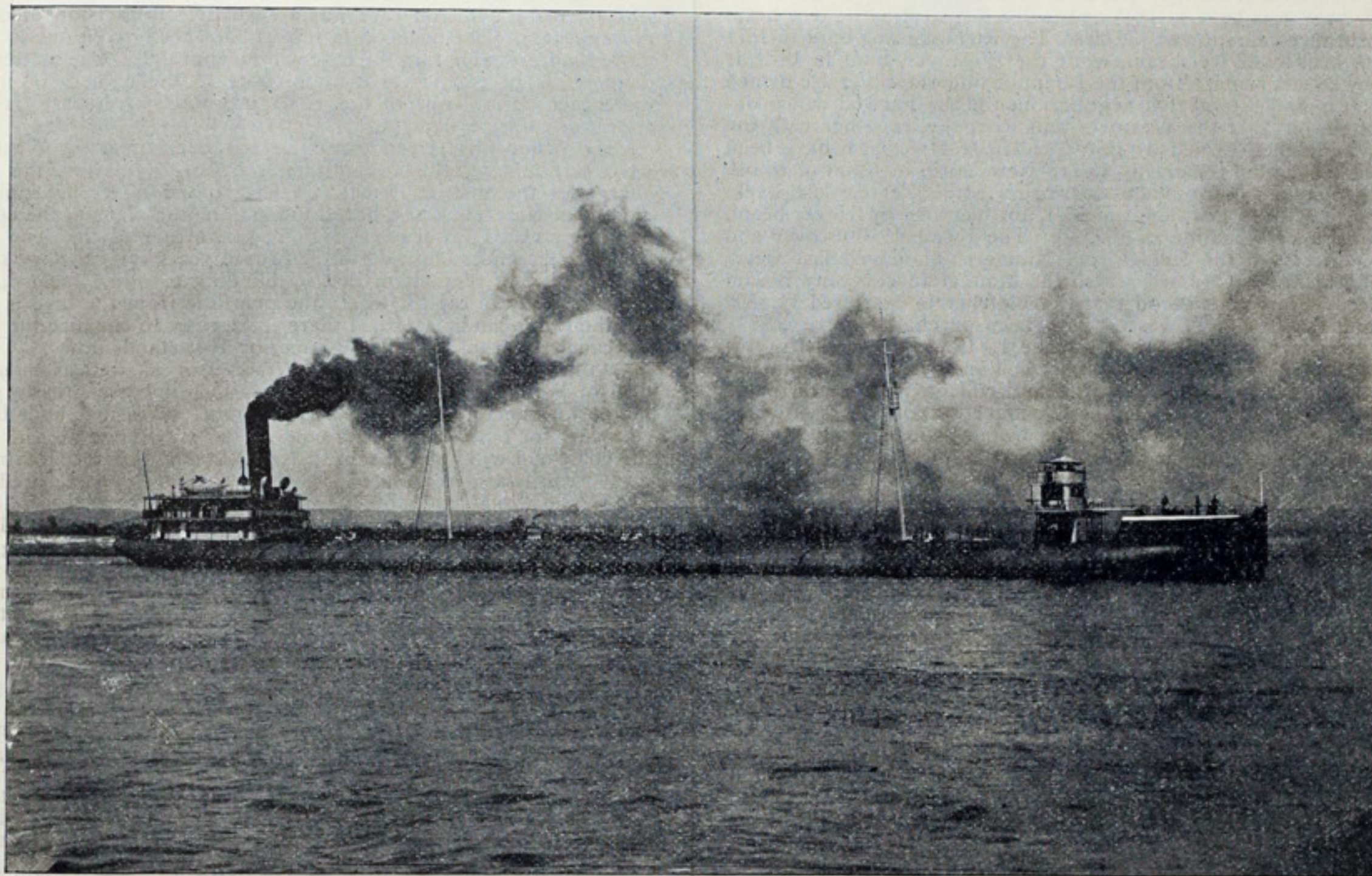
The total steam tonnage amounts to 6,712 vessels of 2,371,923 tons, compared with 6,599 vessels of 2,358,558 tons for the previous year. The vessels sold to the government were all steam vessels, so the true increase is greater than the figures indicate. Sailing vessels have decreased from 1,904,153 tons for 1897 to 1,835,827 tons for 1898. Documented canal boats and barges amount to 541,988 tons, compared with 506,309 tons for the previous year. The increase is chiefly in barges, which are super-seeding sail vessels, especially in the coal trade.

Tonnage on the Atlantic and gulf coast has dropped from 2,647,796 tons for 1897 to 2,553,739 tons for 1898. The great lakes tonnage shows a slight increase, 1,437,500 tons, compared with 1,410,103 tons. The new Alaskan trade has increased the Pacific coast marine from 439,012 tons to

## CAREFUL HANDLING OF SHIPS FOR THE COAST.

A LETTER FROM THE SUPERINTENDENT OF THE CANADIAN COMPANY IN CHARGE OF THE WORK.—EVERYTHING SUCCESSFUL THUS FAR.

Editor Marine Review:—The Buffalo Courier states that the steamer Aragon "met with some hard usage in passing through the rapids of the River St. Lawrence," and now it is said in other quarters that the orders of the company are to pull these boats through whether they are damaged or not, or word to that effect. Would you allow us to make a short statement, which will no doubt be read with interest by many in Cleveland and vicinity who are interested in the movement of this large fleet to the Atlantic coast? The Donnelly Salvage & Wrecking Co. has been entrusted with this work, and the orders from the Atlantic Transportation Co. of New York, through their manager, W. S. Bessie, Esq., are to take these boats down without running any risk whatever of doing them damage. It is true that the pilots of the River St. Lawrence informed our company that it was impossible to take these boats down the Coteau rapids in October drawing more than 6 feet 6 inches of water. It is also true that the Richelieu & Ontario Navigation Co's steamers quit running the rapids on the first of this month; but, although most of the Atlantic Transportation Co's vessels draw more than 7 feet of water, and are much larger and more unwieldy to handle than any passenger steamers running on the St. Lawrence river, we have been able thus far to take them down without a scratch. At the present time we have fifteen boats through to Montreal.



WHALEBACK STEAMER ALEXANDER MCDUGALL—BUILT BY THE AMERICAN STEEL BARGE CO., WEST SUPERIOR, WIS.

The Alexander McDougall, the largest vessel of her class ever constructed, went into commission on the great lakes a few weeks since. She is 430 feet over all, 414 feet keel, 50 feet moulded beam and 27 feet deep. She is fitted with quadruple expansion engines, built by the Cleveland Ship Building Co., and Babcock and Wilcox boilers, which constitute the largest water tube units ever constructed. On her initial trip from Duluth to Cleveland, the McDougall carried 7,319 net tons of ore on a draught of 17 feet 9 inches.

496,767 tons. Western rivers have decreased from 272,109 tons to 261,732 tons. New York state retains the first place, with tonnage reduced from 1,331,743 to 1,299,825 tons; Michigan is still second with a reduction from 477,602 to 458,100 tons; and Ohio stands third with 395,618 tons, an increase of about 6,000 tons. The greatest increase is in Washington, from 97,796 to 152,167 tons, and Alaska from 3,824 to 9,755 tons. New England shows a large decrease, and the gulf states an appreciable increase.

Vessels registered for foreign trade number 1,136 of 737,709 tons, compared with 1,230 of 805,584 tons for 1897. These figures are the lowest since 1832. The decrease is wholly in sail vessels, of which 159 of 103,000 tons, or about 20 per cent., have been lost, laid up or gone into domestic trade during the year. Registered steam vessels have increased from 222,136 tons to 245,059 tons. Through the greater efficiency of steam vessels, our fleet for the foreign trade does not show a decrease in carrying power.

The effect of the war is shown in the sale of eighty-four vessels of 35,411 tons to foreigners, compared with sales of 8,243 tons the previous year. The sales were chiefly due to high premiums on American vessels and cargoes, demanded by insurance companies during the brief period while mines and torpedoes were being placed in our harbors. The effect of the war is also shown in the admission by acts of congress of 27,824 tons of foreign vessels to American registry, chiefly for transport purpose. During the preceding eight years only 55,902 tons were so admitted.

The Nickel Plate road has authorized a low excursion rate to Omaha on Oct. 25, account the exposition. This will be the last date on which such rates are in effect. Agents of the Nickel Plate road are in position to furnish complete information. 231, Oct. 22.

It is true that the steamer Aragon turned around with us in the rapids, but the bottom of this steamer was not injured in the least, and after a careful examination she proceeded on her voyage to New York without docking. We can scarcely expect to take all of these vessels through without meeting with a few mishaps, but by careful and judicious handling and the employment of the best pilots on the River St. Lawrence, we hope to finish the work without any serious accident or delay. The northeast wind of the past week has somewhat delayed the work, but we hope for a change shortly, when things will go along smoother than they have done.

The only barges taken down previously drew a great deal less water than these boats, and were taken down in the middle of the season, when the water was high. If we get these boats through safely, we certainly think we are entitled to some credit for the work. We therefore wish to say in conclusion that it is the wish of the Atlantic Transportation Co. and ourselves that these vessels be taken down without touching bottom in the rapids, and so far we have succeeded in this. The veteran pilot George Haines of the American Line, for so many years past known as one of the most careful and responsible pilots on the St. Lawrence river, has entire charge of the pilotage, and engages whatever men to assist him he finds necessary. To him is due all the credit for the successful running of these boats through the Coteau, Split Rock and Cascade rapids.

DONNELLY SALVAGE & WRECKING CO.,

Kingston, Ont., Oct. 17, 1898.

J. Donnelly, Supt.

Reports from Germany accredit the torpedo boat destroyer Hai Lung, built at the Schichau works, Elbing, for the Chinese government, with a speed of 35.2 knots, or 40.8 statute miles. This surpasses the performance of the Turbinia.



## TRANSFERS OF LAKE TONNAGE.

PLANS FOR THE UTILIZATION OF SOME OF THE OLDER TYPE OF GREAT LAKES CRAFT IN ATLANTIC AND PACIFIC COASTWISE TRAFFIC.

A continuation of negotiations for the transfer of lake tonnage to the Atlantic, and in one case which developed this week even to the Pacific, has served to keep alive a very active interest in operations of this character and in the speculative phase of chances for the success of the scheme. The Atlantic Transportation Co. of New York, the company which has been the most extensive charterer of lake craft, has added to its fleet by the charter of the steel steamer Viking, owned by F. W. Gilchrist of Alpena. The Viking was built in 1889 and is 217 feet keel by 37 feet beam and has a carrying capacity of about 1,800 tons. Her insurance valuation is given as \$80,000. On the other hand, it is now certain that the steamer Lindsay and the schooners Brunette and Checotah, chartered by the Atlantic company, will be released on account of an inability to get them through the rapids. The withdrawal of these three vessels reduces the aggregate carrying capacity of the vessels chartered by the Atlantic company to the extent of 4,500 tons. The Atlantic company is now figuring for the purchase outright of a tug owned on the Detroit river. Mr. H. A. Harvey, treasurer of the company, will arrive in Cleveland Friday to take up this and other matters.

Four vessels for the purchase or charter of which negotiations have been in progress during the past week, are the wooden steamers F. W. Fletcher and George Farwell and the iron steamers Roanoke and Westover. The Farwell was built in 1895 and is 182 feet keel by 34 feet beam and has an insurance valuation of \$50,000. The Roanoke was built in 1871 and is 164 feet keel by 27 feet beam, while the Westover, built in 1872, is 165 feet keel by 28 feet beam. Both the Roanoke and Westover are owned in Chicago. It is understood that negotiations for the Farwell will probably fall through, but that the Westover and Roanoke, together with the steamer F. W. Fletcher, owned by F. W. Gilchrist of Alpena, have been secured by the Manhattan Steamship Co. of New York, mention of whose desire to secure some lake tonnage was made in the Review last week. The Fletcher is a wooden boat, built in 1891, 161 feet keel by 32 feet beam, and has an insurance valuation of \$30,000. The Fletcher, Westover and Roanoke, together with the Linden and Runnels announced last week, probably make up the five vessels which the Manhattan company is said to have secured. It is understood that the Fletcher is chartered at \$800 per month, and that the other vessels have been purchased outright.

The steamer (formerly schooner) George L. Colwell, a vessel of 154 feet keel by 30 feet beam, owned by Jessie A. Van Slyke of Detroit, has departed for Montreal with a load of wire and will go from there to the coast on her own account. The schooner Penokee is another vessel which will engage in the Atlantic trade. She is a wooden vessel, built in 1872, 139 feet keel by 26 feet beam and with an insurance valuation of \$4,500. Messrs. Thompson and Ryan, operating as the Porto Rico Transportation Co., have fitted her out with new gear, new sails and a donkey boiler, and she will take a cargo of illuminating oil from Toledo to Montreal, and at the latter port will load lumber for Porto Rico. It is also learned that Cook & Co. of Tacoma, Wash., operating the steamer North Pacific on the Tacoma-Vancouver route, are negotiating for the purchase of the steamer Bon Voyage, now on the lakes, with a view to placing her on the above route. The Bon Voyage is a wooden freight and passenger vessel, built in 1891, 153 feet keel by 30 feet beam, and has an insurance valuation of \$20,000. Men identified with the shipping interests are discussing the question of ability of the vessel to make the trip around the Horn.

## NO CHANGE AMONG VESSEL MEN.

THEIR POSITION REGARDING A DETROIT RIVER BRIDGE IS THE SAME AS IT HAS ALWAYS BEEN—AN IMPORTANT LETTER ON THE SUBJECT.

An interview in one of the Detroit newspapers, several days ago, with Mr. Russell, general counsel for the Michigan Central Ry. Co., intimated that the vessel interests of the lakes were disposed to make concessions to the railways in the matter of the proposed railway bridge over the Detroit river, which will undoubtedly come up again in the next congress. The Review said last week that there was no reason to expect a change of any kind in the position of the vessel owners, and this opinion is borne out by the following extracts from a letter just written to President Dunham of Chicago by Harvey D. Goulder, counsel of the Lake Carriers' Association:

"I was in Detroit recently and happened to meet Mr. Russell, general counsel of the Michigan Central road. He spoke on the bridge subject and said he believed a plan could be devised which would permit the employment of at least one pier in the river without materially obstructing navigation. I told him I was surprised that the railroad companies would persist in coming forward with piers if they really and seriously want a bridge, and I should think that they would get up a plan requiring, if necessary, more money, but so far removing the objectionable feature of the obstruction that they could have at least some hope of getting the matter through congress, as I do not believe any bridge upon the plan of the bridge proposed in the present bill pending by the Wabash and the roads other than the Michigan Central, would ever pass, and that the chances grow less every year. And this, I suggested to him, was not alone because of the increase in lake transportation and the decreased cost, but members of the senate and of the house had become pretty fully educated, through our recent fights, to the importance of the subject; and the question of water transportation and the extension of our merchant marine is engaging the attention of thinking men in this country as never before, having received an additional and important impetus from the achievements of our navy, which has advanced the standing of our flag so wonderfully all over the world.

"He asked me if I would confer with some of the officers of the association with a view to ascertaining whether there would be any use of asking the vessel interests to acquiesce in, or at least not oppose, any bridge except one which had no piers in the water at all, which has always been the position we have taken, as you know. I told him I would at the first convenient time speak about it. He informed me that the Michigan Central would take action this winter, either by combining with the

roads presenting the bill now pending, or by an independent bill. I thought it was well enough to have the fact known, and meeting a reporter of the Detroit Free Press, mentioned it to him, and he saw Mr. Russell, from whom he doubtless obtained the arguments stated in the article, for that was very much as Mr. Russell had talked to me from their standpoint. I did not in any sense agree to the statements of Mr. Russell, either in my brief interview with him or with the reporter, though the latter may have assumed an agreement on my part from the fact that I did not dispute it."

"I know of no change of sentiment on the part of a single vessel owner on this subject, and do not believe there has been any. At some time, the first time you are this way, we had better get together as many members of the association as can conveniently come and talk over the matter."

## Around the Lakes.

The Angus Smith Co.'s elevators C and D at Milwaukee have been leased to Faist, Kraus & Co. for a term of two years. The combined capacity of these elevators is 480,000 bushels.

The first steel elevator ever erected in Wisconsin is nearing completion at Milwaukee for the American Malting Co., the construction contract being in the hands of the Galland-Henning Pneumatic Drum Manufacturing Co. of Milwaukee. The new elevator will cost \$60,000, and the steel tanks will have a combined capacity of 300,000 bushels of grain.

The decision of United States District Judge Swan of Detroit in the Florida-Roby collision case was a surprise. A division of damages was not expected. The decision in full has not been given out as yet, but it is more than probable that the case will be appealed. The matter of dividing damages is of considerable importance to the owners of the Roby, as under her policy—one of the 1896 kind—the owners are liable for one-eighth of collision damage.

An order was issued from the war department at Washington this week announcing the appointment of Col. Lydecker, the engineer in charge of the district, Lieut. Col. Raymond of Philadelphia and Maj. Adams of New York as a board to examine the plans of the company now building a water power canal at Sault Ste. Marie, Mich. The water power company engineers figure that in twenty years the canal would lower the lake 2 feet, but they claim that by building a solid system of stone dams or piers into the rapids, where the overflow from the lake is now carried off, the water can be retarded there sufficiently to equalize the loss through the canal, and thus keep Lake Superior as it stands now.

Officials of the Globe Iron Works Co., as well as members of the firm of W. G. Wilmot & Co. of New Orleans, are greatly pleased with the performance of the tug W. G. Wilmot. This tug, built by the Globe company for ocean service, is now on her way down the St. Lawrence to the coast and will continue on to New Orleans. Before leaving Cleveland the Wilmot was given a trial, on which she developed a speed of 19 miles. The vessel would undoubtedly have attained higher speed but for the unfortunate conditions under which she was tried. She was drawing only 6 feet forward while down to 16 feet aft, so that she was dragging a great body of water after her. In her regular trim, with about 260 tons of coal aboard, she will draw about 14 or 15 feet, even keel. The Wilmot's engines turned over an immense wheel—13 feet diameter and 20 feet pitch—with great ease at a rate of eighty odd revolutions, and there was an abundance of steam all the time during the trial.

J. W. Westcott of Detroit visited Cleveland a few days ago and went the rounds of all the offices of vessel owners trying to sell the wooden steamer Volunteer, one of the vessels of the Alger-Smith fleet, which was built with a great deal of power on account of the raft towing service for which she was intended. Alger, Smith & Co. have no further use for steamers in towing logs and are disposing of them, the Gettysburg, another of their fleet, having been chartered recently to the Atlantic Transportation Co. The Volunteer was offered at about \$45,000, although she has an insurance valuation of \$90,000. As a last resort, Capt. Westcott spoke of the vessel to Capt. Thomas Wilson. Capt. Wilson has been building steel vessels of late, and would probably be pleased to dispose of his wooden craft, but he considered the Volunteer a bargain and purchased her at a little less than \$45,000. "Probably I can sell her during the winter," he said after the deal was closed, "at \$5,000 or \$10,000 over what she cost us." The Volunteer was built in 1888. She is a very good wooden ship, especially suited to towing service, and carries about 91,000 bushels of wheat.

George A. True was last week appointed receiver for the Frontier Iron Works of Detroit upon the petition of Duncan Symington, Thomas K. Christie and William V. Moore, three of the four members of the board of directors and heavy stockholders. It is stated that the business has ceased to be remunerative, largely owing to the fact that almost all the lake ship builders who were formerly patrons of the Frontier company have within the past few years established engine works in connection with their ship building plants. It is believed that the assets of the firm will equal the liabilities.

The American Ship Windlass Co., Providence, R. I., has been given an order for an output of their machines to go onto the steel barge to be built at West Superior for the Standard Oil Co. They also have contracts for equipments to go onto the two steel steamers that are to be built during the coming winter at the Lorain works of the Cleveland Ship Building Co. These are the new vessels thus far contracted by lake builders for delivery next season.

A special dispatch sent out from Bath, Me., this week chronicles the fact that the New England Ship Building Co., Kelley, Spear & Co., and William Rogers have just taken contracts for the construction of fifty wooden barges at an average cost of \$30,000. It is estimated that these contracts will keep the yards busy for two years.

Stockholders and directors of the Roberts Safety Water Tube Boiler Co., 39 and 41 Cortlandt street, New York, will hold annual meetings at Red Bank, N. J., Nov. 1, when the regular dividend of the company will be paid.



## ANNUAL MEETING OF SHIP BUILDERS.

A VERY INTERESTING PROGRAM ANNOUNCED FOR THE GATHERING OF THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS AT NEW YORK.

The official program of the sixth general meeting of the Society of Naval Architects and Marine Engineers was issued today (Thursday). The meeting of the society will take place in New York city, at 10 a. m., Thursday, Nov. 10. Through the courtesy of the president and managers of the American Society of Mechanical Engineers, the meetings will be held in the auditorium of 12 West Thirty-first street, the sessions continuing through Thursday and Friday, Nov. 10 and 11. There will be a banquet at Delmonico's, at 7 p. m., Friday, Nov. 11, to which members and their guests are cordially invited. Tickets, exclusive of wine, will be \$5 each, and they can be obtained at the society's office on Nov. 9, 10 and 11. Notice is given that in general seats will not be reserved and tickets must be presented. It is requested that members obtain tickets as early as practicable. Members intending to propose candidates for membership are requested to notify the secretary in order that the necessary blank forms of application may be forwarded and properly filled out. The

Engine Rooms. By Naval Constructor J. J. Woodward, U. S. N., member.

10. An Electrically Operated 150-Ton Revolving Derrick. By Walter A. Post, Esq., associate.

11. Stability of a Battleship under Damaged Conditions. By Prof. Cecil H. Peabody, member.

Topical discussions of the following questions:

1st. Under the circumstances of the blockade at Santiago, which was the more economical method of maintaining the boilers in readiness for immediate action—banking the fires or keeping them spread but very thin?

2d. Can you give any data as to the cost in coal of maintaining the engines and boilers in readiness for immediate service?

3d. What, if any, difficulty was there in maintaining the supply of fresh water for the boilers and, if there was any difficulty, to what do you attribute it?

4th. As a result of experience on the blockade, what particular points about the machinery were most likely to give trouble, and what could be done to prevent a recurrence of such trouble?

The rules for debate in the discussion of papers and subjects are as



## SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS.

PRESIDENT AND VICE-PRESIDENTS.

Charles H. Cramp.  
T. W. Hyde.

Philip Hichborn, U. S. N.  
Frank L. Fernald, U. S. N.

George W. Melville, U. S. N.  
George W. Quintard.

Wm. H. Webb.

Clement A. Griseom, President.

Charles H. Loring.

F. M. Bunce, U. S. N.  
E. A. Stevens.

Irving M. Scott.  
Theo. D. Willson.

council will meet at 12 West Thirty-first street, New York, on Wednesday, Nov. 9, at 3 p. m. The list of papers to be read at the meeting is as follows:

## THURSDAY, NOVEMBER 10, 1898

1. Torpedo Boat Destroyers for Sea Service, with Special Reference to the Conditions that Prevail on the Pacific Coast. By G. W. Dickie, Esq., member.

2. The Standard Navy Boats. By Arthur B. Cassidy, Esq., member.

3. Bilge Keels and Rolling Experiments U. S. S. Oregon. By Assistant Naval Constructor Lawrence Spear, U. S. N., member.

4. Steam Economy Test of a Unique Form of Feed Pump. By F. M. Wheeler, Esq., member.

5. Portable Pneumatic Riveters in Ship Building. By W. I. Babcock, Esq., member.

Topical discussion of the following questions:

1st. The utility of torpedo boats, and has the submarine boat a place?

2d. In what respects have the recent naval engagements affected opinion as to the value and best distribution of armor for warships?

## FRIDAY, NOVEMBER 11.

6. The Steam Yacht as a Naval Auxiliary. By William P. Stephens, Esq., associate.

7. Designs of the New Vessels for the U. S. Navy. By Chief Constructor Philip Hichborn, U. S. N., vice-president.

8. Methods of Testing Water-tight Bulkheads in U. S. Navy. By Assistant Naval Constructor H. G. Smith, U. S. N., associate.

9. Tests of the Strength of a Longitudinal Bulkhead Separating Two

follows: First, guests of the society are cordially invited to take part; second, each speaker is allowed one period of ten minutes for each paper or subject; third, rejoinders are in order only by writers of papers to answer questions in closing the discussion.

Hon. James Fisher of Winnipeg, Man., wrote one of the principal officers of the Lake Carriers' Association recently for certain information that is to be embodied in a report to the Canadian government. Following is an extract from the answer to Mr. Fisher's inquiry: "The Marine Review, a paper devoted to marine interests, published in this city, will send you today statistics and information which they have gathered on the questions suggested in your recent favor to me. They have compiled and in shape for speedy reference many interesting statistics in regard to our lake commerce. I have not seen the statistics that will be sent to you, but I have no doubt they will be valuable. Of this you may be certain, that you may rely upon the accuracy of anything you get from the Review, as they are extremely careful and thoroughly well informed. We have gotten so that we go to them as a sort of reservoir of information."

The contract for machinery for the equipment of the new ship yard of the William R. Trigg Co., Richmond, Va., has been awarded to the Hilles & Jones Co., Wilmington, Del. The list included three of their new-design, quick-running punches, double-angle shears, plate-bending rolls, plate-straightening rolls, frame setter, flanging clamps, plate-planing machine and splitting shears. This is the second ship yard outfit which the Hilles & Jones Co. has in hand for the torpedo boat builders.



# MARINE REVIEW

Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.

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There is much of gratification for the American ship builder in the manner in which even the most conservative representatives of the industry in Great Britain are coming to recognize the rapid progress of their American rivals, to say nothing of a half-confessed suspicion of the ultimate result if the operations of the builders in the United States continue to be characterized by the energy and ability manifested during the past few years. The latest surprise for the ship builders on the other side of the Atlantic are the bids submitted recently for torpedo boats and destroyers. When in 1888, only ten years ago, the United States government called for proposals for constructing its pioneer torpedo boat, the Cushing, only one firm felt competent to bid for a 22-knot craft, and even this bid asked for permission to substitute an English boiler, the Thornycroft. When the Ericsson was contracted for in 1892 there were only two bidders, whereas the present award of contracts found fifteen bidders. The same is true of the construction of vessels for the merchant marine. In 1891 all the yards in the United States had on the stocks only 32,300 tons of shipping, whereas at present the Wm. Cramp & Sons Ship & Engine Building Co. alone has on the stocks 36,168 tons for American account and 23,600 tons for foreign account, and in addition four war vessels. Seven American yards have under construction at this time 72,000 tons for American owners, without counting naval vessels. It is not strange, therefore, that it is now admitted, even among foreign builders, that the year 1898 will see an addition of fully 120,000 tons of native built shipping to the American merchant marine, a prospect which is by no means consoling for the ship builders of Great Britain.

Friends of the late Capt. Charles V. Gridley, who was inspector of the tenth light-house district with headquarters at Buffalo, and later commander of Admiral Dewey's flagship, the Olympia, will be interested in a touching letter written to the mother of Capt. Gridley by Admiral Dewey, to appraise her of the exact nature of the malady which carried off the gallant officer. He says: "His loss is mourned by all who knew him, and especially by me, whose friend and trusted and gallant assistant he was. His illness began in Hong Kong, but he bravely clung to his post, and not until after the battle and victory, in which he assisted so much, would he consent to leave his ship and return to the United States. His death was caused by a complication of diseases, including diarrhoea and dropsy, all due to a disordered condition of liver and aggravated by a rupture sustained on the day of the battle. The immediate cause of his death was severe hemorrhage of the stomach, which occurred at Kobe. This was entirely unexpected; indeed, our surgeon had no idea that it would occur or that Capt. Gridley was dangerously ill, although, of course, it was known that he could not remain on duty. It is matter of some gratification to me that I was instrumental in obtaining for him an advancement in his grade 'for highly distinguished conduct in battle,' which he richly deserved, although he did not live to enjoy it."

Lloyd's Register ship building returns for the quarter ending Sept. 30, which have just been issued, show that there are under construction in Great Britain and Ireland 572 vessels of 1,361,557 gross tonnage, and twenty-six sail vessels of 2,693 gross tons, a total of 598 vessels of 1,364,250 gross tons. Warships are excluded. There are under construction in the British governmental dock yards fourteen war vessels with an aggregate tonnage of 110,140 tons, and in private yards seventy-eight war vessels of 266,295 tons, of which forty-four vessels of 155,660 tons are building for the British government and thirty-four vessels of 110,635 tons for foreign powers. It will thus be seen that of the ninety-two war vessels, aggregating 376,435 tons, now building in the yards of the United Kingdom, fifty-eight, aggregating 265,800 tons, are for the British government. Reports regarding ship building in the United States are not collected regularly, but the Review hopes to present some reliable information on this score shortly. On Sept. 17 there was building at Philadelphia, Chester and Wilmington twenty-six steam vessels (warships excluded) of an aggregate of 40,965 tons. This is only one district, the Delaware river. Reports from Newport News, from New England, from the Pacific coast and from the lakes will make a very large grand total when orders now under consideration are placed within the next few weeks.

It is understood that a petition is to be presented to the navy department requesting that the Newport News Ship Building & Dry Dock Co. be assigned the battleship Ohio instead of the Missouri, and that the latter be given to the Union Iron Works, San Francisco, instead of the Ohio, at present allotted to that concern. The reason assigned for the requested change is that Ohio would in all probability send a large crowd to the launching were it at Newport News, whereas it is unlikely that the state would be so largely represented at San Francisco.

The Italian government has finally adopted Belleville boilers. It is announced that the French generators will gradually replace other types of boilers in all old vessels of the Italian fleet. The cruiser Puglia, recently launched at Tarentum, which is fitted with horizontal triple expansion engines, will have furnaces under her boilers so arranged that oil fuel may be used.

Evidence that the lessons of the battle of Santiago are being widely appreciated is found in the order sent out by Admiral Palumbo, the Italian minister of marine, to the effect that as little wood as possible be used in fitting up ships, and recommending the use of aluminum wherever possible in the interior of battleships, in order to secure both lightness and incombustibility.

Reports just issued by the bureau of construction, navy department, showing progress made on the United States battleships now under construction, give the Illinois as 55 per cent. completed; Kearsarge, 68 per cent.; Kentucky, 66 per cent.; Alabama, 63 per cent.; Wisconsin, 48 per cent. The torpedo boats Rowan, Davis and Mackenzie are all 99 per cent. completed.

Greater difficulty than at first reported was experienced in floating the sunken Spanish cruiser Infanta Maria Teresa. The ship's bottom could not be made tight, and when she was hauled off she had probably 500 tons of water in her forward compartments, and with all pumps going was drawing 27 feet forward, or 6 feet more than her normal draught.

The old revenue cutter Andy Johnson, which has been used as a practice ship by the Cleveland Naval Reserves, has been sold to J. Harrington Walker of Detroit, who is understood to represent a Canadian company that will rebuild the vessel and use her for passenger and freight purposes.

A Spanish cruiser, the Rio de la Plata, for which Spaniards in the Argentine Republic and Uruguay subscribed the funds, has been launched at Havre. The vessel is of 7,100 indicated horse power and her speed is estimated at 16½ knots.

A considerable increase in the Russian navy will be made this month by the launch of the battleship Osliaha, the cruisers Diana, Pallas and Aurora, and the destroyer Amur, all of which are under construction at St. Petersburg.

The revenue cutter Algonquin, built by the Globe Iron Works Co., Cleveland, and taken through the canals and down the St. Lawrence, has arrived at Philadelphia, where she will replace the revenue cutter Hamilton.

The battleship Indiana, which has been at the New York navy yard, has been supplied with bilge keels, and her smokestacks have been lengthened 10 feet.

## Handbook of Engineering Laboratory Practice.

Students in the engineering branches have been offered no more valuable text book than "A Handbook of Engineering Laboratory Practice," by Richard Addison Smart, M. E., associate professor of experimental engineering at Purdue university, the first edition of which has just come from press. The volume is intended primarily as a manual for the use of students in the routine of experimental work in steam engineering, strength of materials, and hydraulics. It may also serve in a limited way as a guide for those engineers in active service whose familiarity with the ordinary methods of testing is limited. The chief object in view has been to provide in convenient form such directions for the conduct of the various tests and experiments comprising the course as the student will need to enable him to take charge of and conduct the particular work assigned him in an intelligent manner and with little delay. With a large class of students beginning a variety of experiments at the same time it is essential that the directions be such as to make each student or group of students as nearly self-directive as possible. No attempt has been made, therefore, to preface the consideration of the subject from an experimental standpoint with an exposition of the theoretical considerations involved; it is assumed that the class-room work, which should be carried on in connection with that of the laboratory, will supply the theoretical instruction. The methods of testing described under the various general heads are not intended to cover the subject in an exhaustive way. Only such tests have been described as may be carried on in connection with the complement of apparatus to be found in the better equipped laboratories of experimental engineering, and the methods explained are those which the author has found to be most easily employed in every-day practice. Both the manner of arranging apparatus and the method of conducting the tests are capable of great variation to suit the needs of special investigations. Since the equipment of the majority of engineering laboratories does not permit all the students in a class to take up the course of experiments and tests in the same order, it becomes necessary to make the directions for the various tests complete in themselves and avoid, so far as possible, reference to tests described in preceding sections. This necessitates the occasional repetition and duplication of directions which occur in the volume. It is fully illustrated.

Published by John Wiley & Sons, New York. Price \$2.50.

## New Type of Ocean Freight Steamer.

The Hamburg-American line has placed an order with Blohm & Voss of Hamburg for a twin-screw steamer, which, it is claimed, will be the largest cargo carrier in the world. The vessel will be 600 feet on the water line, 66 feet beam, and 42 feet depth, and the total capacity for cargo, exclusive of coal, etc., will be 14,000 tons of 2,240 pounds, or about 20,000 tons of 40 cubic feet. The steamer will have accommodations for 300 passengers in the first and 200 passengers in the second cabin, as well as berths for 600 steerage passengers. The vessel will have a bilge keel and will be driven by two sets of quadruple expansion engines of a power sufficient to maintain a speed of 14 knots. In the announcement regarding the vessel sent out by Mr. Emil L. Boas, general manager of the Hamburg-American line, stress is laid upon the advantage which will accrue from the introduction of an innovation in the form of double sides. Information as to the space between the outer and inner shells of the vessel and weights of the same has not, however, been given out, and until this and other points are determined ship builders may be pardoned skepticism as to whether the strength or safety of the vessel will be materially enhanced.

Receipts of coal at Milwaukee this season show a heavy increase. Up to Oct. 1, the receipts of anthracite were 516,617 tons, as against 330,658 tons for the corresponding period last year, and 508,036 tons of bituminous, as against 304,217 tons in the same period in 1897.

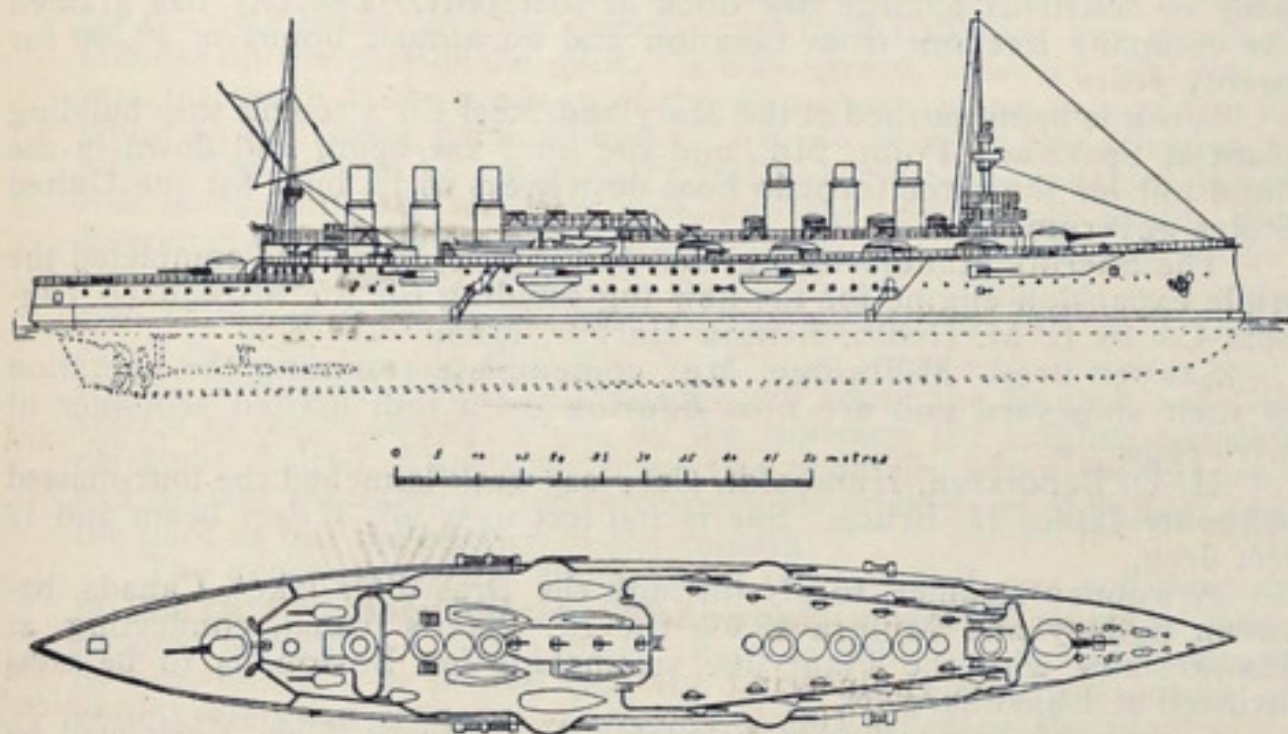


## NOVEL FRENCH WAR SHIPS.

ARMORED AND PROTECTED CRUISERS OF UNIQUE DESIGN AND EQUIPMENT NOW UNDER CONSTRUCTION FOR THE FRENCH GOVERNMENT.

The Review herewith presents outboard and deck plans of some of armored and protected cruisers now building for the French government, and which by their novelty of general design and innovations in equipment will be of especial interest to naval architects and ship builders everywhere. The French architects have been famous for displaying the courage of their convictions in the introduction of innovations in the construction of naval vessels, and some radical ones have assuredly been introduced in the cruisers to be hereafter described. They are the more interesting in that they constitute the French solution of the problem for uniting great speed, powerful artillery and efficacious protection in a vessel of moderate displacement.

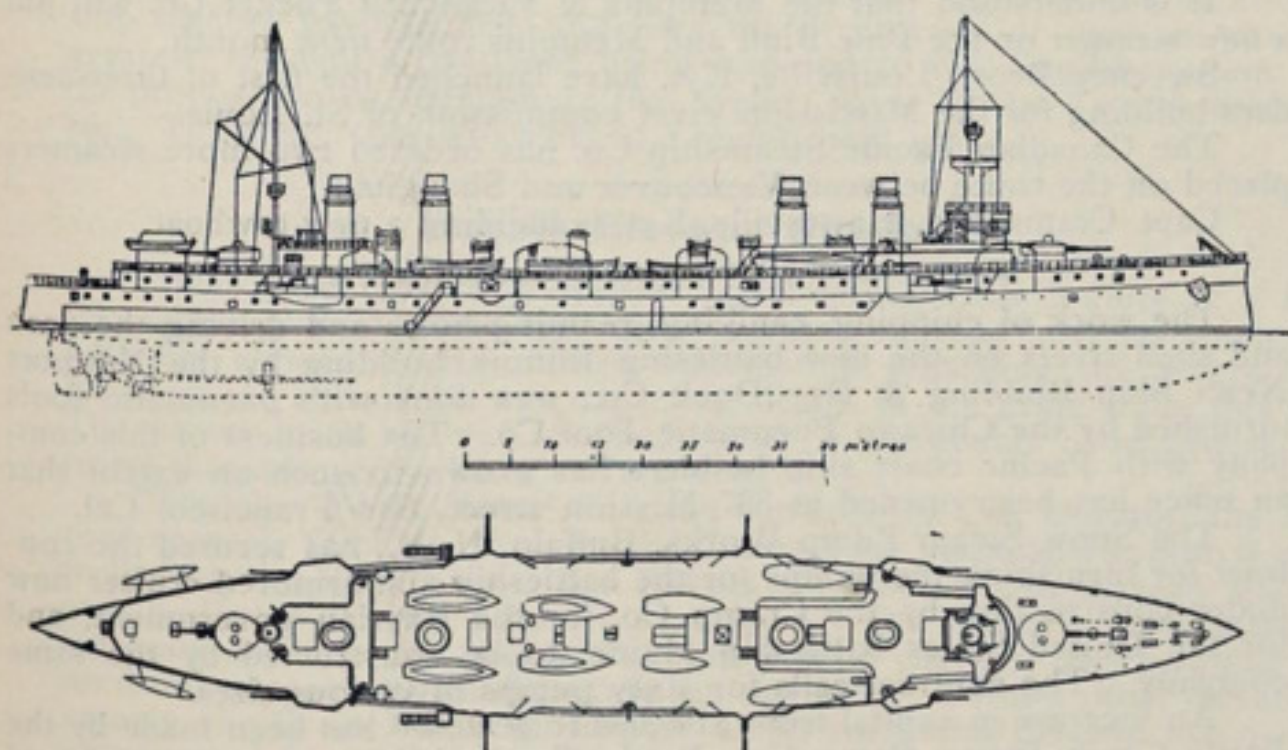
The armored cruiser Jeanne D'Arc, now nearing completion at Toulon, is 476 feet over all, 64 feet beam and 25 feet mean draught, the displacement with 1,400 tons of coal aboard being 11,270 tons. The hull is subdivided after the fashion of battleships. There are two armored and a protective deck. The side armor is arranged in two strakes, the lower one having a thickness of about six inches at the upper edge and at the



ARMORED CRUISER JEANNE D'ARC.

water line. The thickness gradually diminishes from the water line to the lower edge and from amidships to the extremities. The lower armored deck is of plating of a thickness of 2 inches and the upper armored deck has a double thickness of plating. Above the armored deck is the main deck, which runs from one extremity of the ship to the other, and the spar deck, which runs from the turret to the bow. Above these is a small bridge around the mizzen mast, and a large bridge which runs from amidships to the forward turret. The armament includes two 7.6-inch guns, fourteen 5.5-inch guns, and twenty rapid-fire guns.

The motive machinery occupies nearly three quarters of the length of the central part of the vessel. It includes three engines placed between two groups of fire rooms. Steam is generated in forty-eight Guyot-Du-Temple boilers, with a total grate surface of 1,636 square feet. The boilers are distributed in two groups, each having four fire rooms, and each group provided with three funnels, the middle one being placed at the intersection of the longitudinal and transverse bulkheads, which separate each group into the four fire rooms. The three engines are placed in three water tight compartments, one in the center and two forward. The turrets, blower, ammunition hoists and steering engine valve gear are



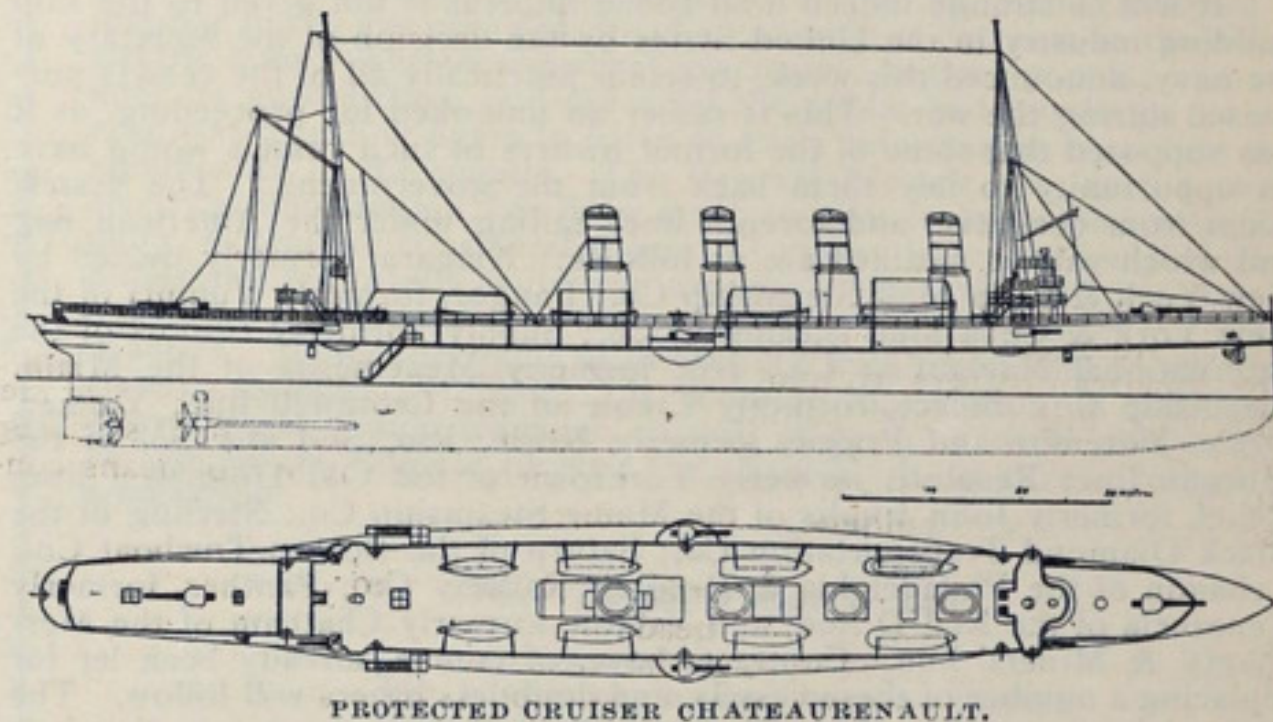
ARMORED CRUISERS MONTCALM, GUEYDON AND DU PETIT-THOUARS.

worked by electricity, and there are six search lights. The normal supply of coal is given as 1,400 tons but by filling with coal the different available compartments, the capacity may be brought up to 2,100 tons. The vessel is also equipped with tanks for carrying a limited amount of liquid fuel. The principal experimental feature of the Jeanne d'Arc is found in how the boilers will perform in ordinary service. Their power is not in question, but as was stated in an editorial reference to this vessel translated by the Journal of the American Society of Naval Engineers from Le Yacht, their endurance in regular service, and the maintenance during periods of reserve, may give rise to a disappointment.

The armored cruisers Gueydon, DuPetit-Thouars and Montcalm are of a design that is essentially a modification of that of the Jeanne d'Arc, by a reduction of power and coal supply. The armament and protection are practically the same as for that vessel. The three cruisers named are

each 451 feet over all, 63 feet beam, 23 feet mean draught, 9,500 tons displacement, 1,025 tons coal supply, 19,000 indicated horse power and 21 knots speed. The propelling machinery consists of three triple expansion vertical engines, each in a separate compartment. The Montcalm will have twenty Normand-Sigaudy or torpedo boat boilers; the Du Petit-Thouars twenty eight Belleville boilers, and the Gueydon twenty eight Niclausse boilers. The latter are generally considered to be more reliable from the standpoint of maintenance than the torpedo boat boilers. The auxiliary engines are numerous and include fourteen electric ammunition hoists, twelve boilers for forced draught and for ventilation below the protective deck, and three Thirion bilge pumps, with an aggregate capacity of 600 tons per hour. The Montcalm is building by Forges & Chantiers, at La Seyne; the Du Petit-Thouars by the dock yard at Toulon, and the Gueydon by the dock yard at Lorient.

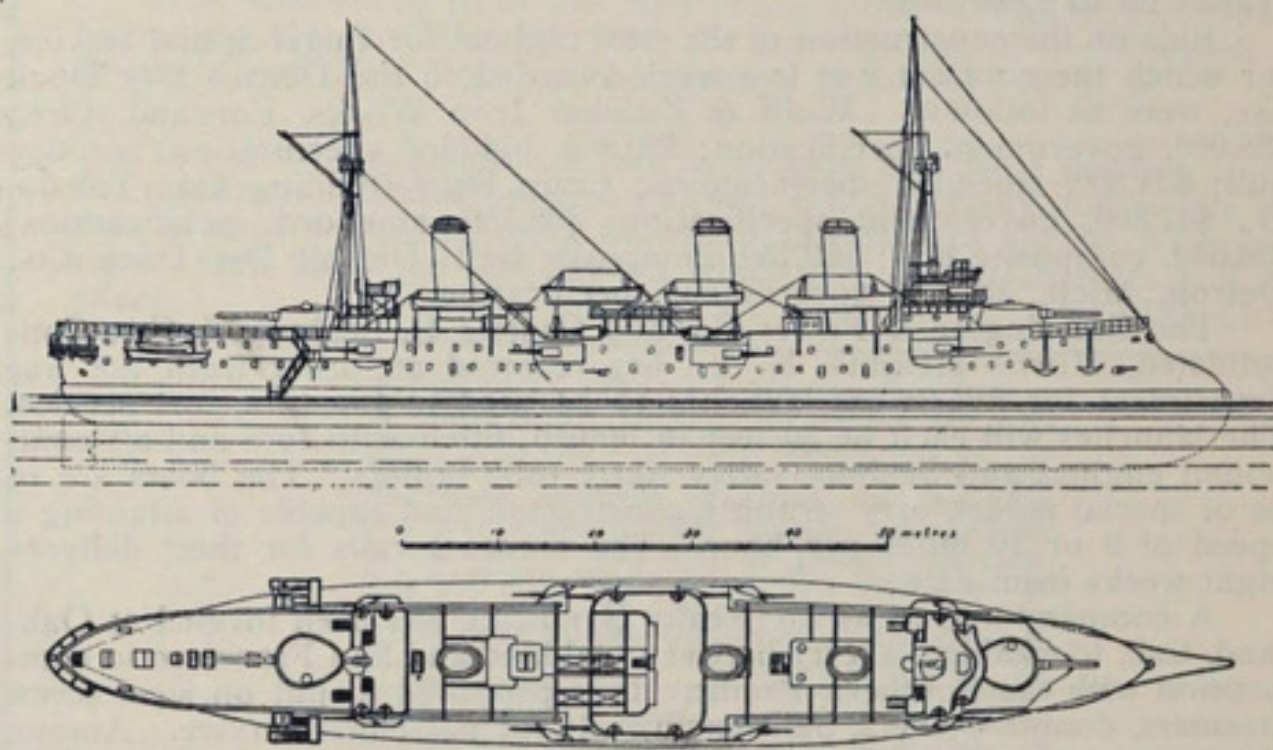
The protected cruiser Chateaufort will be of particular interest to American naval architects for two reasons; in the first place the ship was designed as an improvement on the United States cruiser Minneapolis and it also marks the first attempt to disguise a war vessel by giving her in so far as possible the appearance of a merchantman. The plans for this vessel were the result of an invitation from the ministry of marine for competitive designs from private builders for two commerce destroyers. The architects asserted that their great effort had been to avoid the appearance of a man-of-war; so clearly discernable in the American com-



PROTECTED CRUISER CHATEAUFORT.

merce destroyers Minneapolis and Columbia, by reason of the retreating bow and stern. The silhouette is to a great extent that of a merchant steamer. The straight stem, long shear, overhanging stern and pole masts will all combine, it is claimed, to give the vessel the exact appearance from a distance of a transatlantic liner. Moreover, it is claimed that the straight stem, slightly inclined aft, will prove advantageous for a vessel that will find it necessary to maintain a high speed, often in a heavy sea. The funnels are four in number, as on the Columbia, and the outer casings stop about sixteen feet lower than the funnel proper, thus obviating useless weight at a great distance above the center of gravity. A comparison with the Minneapolis will perhaps give American readers the best idea of the cruiser. She is 457 feet over all, while the Minneapolis is 415 feet, but only 55 feet beam as against 58 feet. The draught of each is 24 feet, but the French vessel has 23,000 horse power as against the American cruiser's 21,000. The new boat also has a bunker capacity of 2,100 tons, while the United States Cruiser has a capacity of but 1,518 tons.

The propelling machinery of the Chateaufort consists of three triple expansion vertical engines, each working a separate screw and developing 23,000 horse power at about 124 revolutions. The boilers which originally were to have been of the the Lagrafel-D'Allest type have been changed



PROTECTED CRUISER D'ENTRECASTEAUX.

and will consist of fourteen Normand-Sigaudy boilers, with small tubes, divided into four unequal groups, three of four each, and one group of two forward. There was utilized for the first time in the launch of this vessel a new method for stopping the vessel after it left the ways. The breaking stoppers were combined with dead weights of 24 tons of pig iron (12 on each side) which dragged on the ground, forming a powerful brake.

The protected cruiser D'Entrecasteaux is 384 feet over all, 58 feet beam, 23 feet mean draught, 8,114 tons displacement, 13,500 indicated horse power and 19 knots speed. The boilers have been arranged for the use of liquid fuel in addition to coal, and in accordance with this plan there have been fitted in the double bottoms tanks for 10,000 gallons of liquid fuel. The burners will be fed by Thirion pumps, drawing from special reservoirs. Electricity is used for working the turrets, blower, ash and ammunition hoists.



## SHIP-BUILDING BOOM.

PLENTY OF WORK IN SHIP YARDS ALL OVER THE COUNTRY.—ENCOURAGING PROSPECTS FOR NEW BUSINESS.—THE MACHINERY MARKET.

London shipping journals state that the United Steamship Co. of Copenhagen is in negotiation with a Philadelphia ship building company—presumably the Cramps—for the construction of four large swift steamers to be put on the New York line. Proof of the fact that this circumstance has considerable significance is afforded by the evident anxiety of the British interests to make it appear that the reason for the United Steamship Co. coming to America with this order is found in the fact that "all the English yards are at present full of work." Another report, coming this week from a reliable source, is to the effect that a second big dry dock is to be built at the yard of the Wm. Cramp & Sons Ship & Engine Building Co. at Philadelphia. It is stated that the present dock at the leading Philadelphia yard is much too small to accommodate many vessels needing repairs, and the steadily increasing business of the company makes another basin an imperative necessity. The dimensions of the new dock and the material of which it is to be constructed have not, according to reports, been made public, but it is understood that it will be large enough to meet all the demands that may be made upon the ship building plant.

It will be strange indeed if an added impetus is not given to the ship building industry in the United States by the decision of the secretary of the navy, announced this week, to retain practically all of the vessels purchased during the war. This is rather an unlooked for proceeding, as it was supposed that some of the former owners of such vessels would have an opportunity to buy them back from the government. The vessels taken from coastwise and foreign lines sailing under the American flag and which will be retained are as follows: Niagara, formerly owned by New York & Cuba Mail Steamship Co.; Bangor, formerly Yumuri of the New York & Cuba Mail Steamship Co.; Supply, formerly Illinois of the International Navigation Co.; Iris, formerly Menemsha of the Miami Steamship Co.; Solace, formerly Creole of the Cromwell line; Yankee, Dixie, Yosemite and Prairie, formerly Norte, Rio, Sud and Sol of the Morgan line; Resolute, formerly Yorktown of the Old Dominion line; Relief, formerly John Englis of the Maine Steamship Co.; Sterling of the Black Diamond Transportation Co.; Saturn of the Boston Towboat Co.; Lebanon of the Philadelphia & Reading Railway Co.; Panther, formerly Venezuela of the Red D line; and Vulcan, formerly Chatham of the Merchants' & Miners' line. Contracts have, of course, already been let for replacing a number of these vessels, and doubtless others will follow. The demand for tugs and yachts will also probably be increased, now that it is known that none of those purchased are to be returned.

Bids for refitting the steamer Massachusetts as a permanent government transport are as follows: Atlantic Works, East Boston, Mass., \$109,000; Morse Iron Works, \$96,000, the work to be completed in fifty working days; Maryland Steel Co., Sparrow's Point, Md., \$137,000, the work to be completed in ninety days; John N. Robins Co., \$98,000; Newport News Ship Building & Dry Dock Co., \$99,500, the work to be completed in eight weeks; William Cramp & Sons' Ship & Engine Building Co., \$120,000, the steamer to be completed by Dec. 10 if turned over at once; if allowed to go to sea first, then in sixty days from date of delivery, at the same price, with, however, extra charges for any work in addition to that named in the specifications.

Competition in vessel repairing bids fair to become decidedly brisk in British Columbia. The British Columbia Marine Co. has purchased the Esquimalt Marine Railway and announces its intention of enlarging the plant, building a smaller plant at Victoria Harbor, and to build also another marine railway at Vancouver. Now it is announced that a United States syndicate, headed by J. Clarke, a Victoria ship builder, has purchased the Star yard at the head of Victoria harbor, until recently managed by T. Trahey, and will build a slip and make arrangements to handle vessels up to 2,000 tons.

Bids on the construction of the steel tugboat for Puget Sound service, for which the contract was last week awarded to the Detroit Dry Dock Co., were as follows: Wolff & Zwicker Iron Works, Portland, Ore., \$38,000, government specification; \$29,800, bidders' specification, wooden hull; \$34,500, amended specifications; Craig Ship Building Co., Toledo, O., \$47,500, government specification; \$39,750, amended specifications; \$36,850, composite hull; \$29,750, composite hull; Detroit Dry Dock Co., Detroit, Mich., \$37,000 government specification.

The Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, N. Y., has received an order from the war department for five steam launches to be used in the transport service. The launches will each be 30 feet in length, fitted with fore-and-aft compound engines and Seabury safety water tube boilers. The boats are to be of special model, very strongly constructed, and capable of attaining a speed of 9 or 10 miles per hour. The contract calls for their delivery eight weeks from date.

A company known as the Realty Syndicate has been formed at Oakland, Cal., to establish a ferry between Oakland and San Francisco in competition with the Southern Pacific. It is proposed to put on steel screw steamers, double deckers, built exclusively for passenger service. Among the prominent men interested is Frank M. Smith, president of the Oakland Transit Co.

Announcement is made in a dispatch from Ottawa that Mr. E. F. Johnson of L'Orignal, Quebec, has organized a company of United States capitalists, and that the steamers Empire State and St. Lawrence will be secured and placed on the route between Ottawa and Montreal next season in opposition to the Ottawa River Navigation Co.

Capt. Ed. Howard, Jeffersonville, Ind., has launched the steamer America, building for Capt. Cooley. Other launches at the Howard yard in the near future will be the steamer City of Cincinnati and also the steamer J. B. Richardson, building for Capt. Tom Ryman, who will place her on the Cumberland river route.

Rumor states that the Express Steamship Co. will be organized at Providence, R. I., and three large steamers placed on the route between that city and New York. Lester C. Hillard of East Providence and George A. Jencks of Pawtucket, R. I., are said to be among the men interested.

Incorporation was made in New York state this week of the Bonner-Hall Co. of New York. Its avowed object is to contract for and equip naval vessels, deal in machinery and boilers, operate ship yards, etc. Capital, \$50,000. William G. Bonner, 314 Baltic street, Brooklyn, N. Y., is prime mover in the enterprise.

An electric light plant has been installed at the plant of the Iowa Iron Works, Dubuque, Ia., and work is now being rushed night and day. In addition to the six steel vessels building for the United States government the company is building a passenger steamer for parties at Natchez, Miss.

Garrison & Wood, Los Angeles, Cal., invented a type of steamer with pneumatic caisson and air lock elevator for gold dredging purposes, and it is understood will construct one for experimental purposes. It will be 120 feet in length by 28 feet in width, and will cost \$20,000.

A tug is under construction at New Baltimore (On the Hudson), N. Y., for Smith & Robinson, Albany, N. Y. She is 65 feet over all, 50 feet keel, 15 feet beam and 6 feet depth of hold. Boilers and engines are from Skinner & Arnold, Quay street, Albany, N. Y.

A company has been formed to establish a steamboat line between Hawkingville and Brunswick, Ga., and a steamer will be built or purchased at once. F. McBrown of Brunswick, Ga., is secretary of the company.

George Robertson, St. John, New Brunswick, will organize a company to construct a large dry dock at that port. The city has granted the company freedom from taxation and an annual bonus of \$2,500 for twenty years.

Work is being pushed at the Maryland Steel Co.'s rebuilt ship building plant at Sparrow's Point, Md., and the lines are being laid down in the mold loft for the three torpedo boat destroyers to be built for the United States government.

The Sheriffs Manufacturing Co., Milwaukee, Wis., has completed the triple expansion engine for the new tug building for the Milwaukee Tugboat Co. by E. M. Heath, Benton Harbor, Mich.

Sawyer Bros., Millbridge, Me., contemplate resuming the operation of their ship yard and are now figuring on a four-masted schooner of 1,100 tons.

H. D. Bendixsen, Humboldt, Cal., last week launched the four-masted schooner James H. Bruce. She is 166 feet over all, 37 feet beam and 12 feet deep.

A wooden steamer, to ply through the Bras d'Or lakes, Canada, between Sydney and Mulgrave, via the St. Peter's canal, connecting at Hawkesbury with the Plant line steamships for Boston, is to be constructed at Lunenburg, N. S.

Compound engines constructed by W. Sullivan, New York, will be placed in Howard Carroll's 151-foot wooden propeller Postmaster General, building by Robert Palmer & Sons, Noank, Conn. She will have a speed of 19 knots.

Simon Lake, Baltimore, Md., inventor of the submarine boat Argonaut, will have built a new vessel of the same type. The new craft will be 100 feet over all, while the old boat had a length over all of only 36 feet.

Bids for the steel tugboat for Mississippi river service received by Maj. Thomas H. Handbury at St. Louis, Mo., were: Ed. J. Howard, Jeffersonville, Ind., \$67,750; Thomas M. Rees, Pittsburg, Pa., \$84,500.

The Wolff & Zwicker Co., Portland, Ore., announce that the capital stock of their company will be increased \$250,000, to permit of the construction of a steel floating dry dock of large capacity.

The Hillman Ship & Engine Building Co., Philadelphia, Pa., has secured the contract from the American Gold Dredging Co. for a small steamer to operate in South American rivers.

The Boyer patent water tube boiler recently placed in the tug Wm. H. Beard at South Brooklyn, N. Y., gives her a foot more free board than with the boiler formerly in service.

Rogers & Baker have laid out a ship building plant at Bay Shore, N. Y., and work is already in progress on the erection of a main building, sail loft, saw mill, etc.

It is understood that the Memphis & Vicksburg Packet Co. will put a new steamer on the Pine Bluff and Memphis route next month.

Sweeney Bros., Louisville, Ky., have launched the first of three tenders building for the Mississippi river commission of St. Louis.

The Canadian Pacific Steamship Co. has ordered two more steamers placed on the route between Vancouver and Shanghai.

Capt. Crammond, Hawesville, Ky., is building a new towboat.

## MACHINERY, SHIP BUILDING SUPPLIES, ETC.

The work of chipping, caulking, reaming holes and driving the deck and shell rivets on the new battleship Illinois, building by the Newport News Ship Building & Dry Dock Co., was done with pneumatic tools furnished by the Chicago Pneumatic Tool Co. The business of this company with Pacific coast ship builders has grown to such an extent that an office has been opened at 537 Mission street, San Francisco, Cal.

The Snow Steam Pump Works, Buffalo, N. Y., has secured the contract for furnishing the pumps for the battleship and armored cruiser now under construction by the Cramp Co. for the Russian government, and for the United States battleship Maine, to be constructed by the same company. The contract calls for sixty pumps of various sizes.

An increase in capital from \$100,000 to \$200,000 has been made by the Battle Creek Steam Pump Co., Battle Creek, Mich., manufacturers of March steam pumps. The size of the foundry has been doubled, a 10,000-pound pneumatic traveling crane installed, and other new machinery added.

The bureau of yards and docks of the navy department has issued a notice stating that the date for opening proposals for the construction of a combined floating and graving steel dock at Algiers, La., has been postponed from Oct. 31 to Nov. 30.

Bids are asked until Nov. 5 for constructing the masonry substructure, piers, etc., for the rebuilding of the Centre street bridge over the Cuyahoga river at Cleveland. George R. Warden, director public works.

It is claimed that the United States light-house board has decided to recommend to congress an appropriation for \$50,000 for the establishment of a light-house supply station at Buffalo.

Heldmaler & New of Chicago, who have the contract for building the breakwater at San Pedro, Cal., announce that they are almost ready to begin work.



## QUESTIONS OF MOMENT TO THE MARINE WORLD.

THEY ARE DISCUSSED AT A CONFERENCE FOR THE UNIFICATION OF MARITIME LAW.—THE UNITED STATES NOT REPRESENTED.

The International Conference for the Unification of Maritime Law, held recently at Antwerp, made considerable progress with several questions of special importance to the marine world. Representatives of Great Britain, France, Germany, Holland, Belgium, Denmark, Italy and Norway were present at the meetings. Specifically, the object of the conference was to effect an international understanding on the questions of liability in collision cases and other matters on which the practice of the leading maritime nations are at variance. When the committee got to business it very soon became apparent how widely the various codes vary. In the case of collision by inevitable accident, for instance, where neither vessel is to blame, the Dutch and Portuguese laws rule that if one of the ships be at anchor, the other ship shall bear one-half damage done to the ship, besides all her own. A resolution was therefore proposed, and carried, that in these cases each ship shall bear her own loss, whether one of them was at anchor or not.

The most discussion—and that of an interesting kind—arose on the question of the responsibility of a ship owner when his vessel is in the hands of a compulsory pilot. Under the present law of England, when a compulsory pilot takes command the captain's responsibility is suspended for the time being, and the owner is not held liable for any incapacity or blunder on the part of the pilot. It was agreed, however, that this is not just, inasmuch as the position of the ship owner is not changed in his relation to his vessel, even though he has no voice in the selection of the pilot. The system of compulsory pilotage exists in order to lessen the risk of casualties in entering port, and the ship owner profits thereby. Eventually it was voted by a large majority that the liability of the ship owner should remain under all conditions, the English representatives also voting in favor of the motion, and against the law as it at present exists in England. In this case the French wished to abandon their system of non-responsibility of the pilot and adopt the English and German system of responsibility, while, on the contrary, the English and German delegates desired to see their respective countries adopt the French view and declare the captain always responsible, and, as in Belgium, consider the pilot as but the adviser of the captain.

The question, "What effect ought the fact that one colliding ship is in tow to have upon the liability?" was disposed of with the following adopted resolution: "The towed vessel is liable for damages occasioned by tug, unless it is proven that the latter was not in the service of the vessel, reserving, of course, its rights of action against the tug."

On the question of "When both ships are at fault, how ought the damages to the ship and to cargo be borne? Ought those in fault to be held jointly and severally liable?" much discussion arose, finally resulting in the conference answering the first half of the question and adjourning the debate on the second until next year. The resolution adopted was: "In the case of a collision where both parties are to blame, the damages as to persons and things to be accumulated and shared proportionately to the gravity of the fault committed, but that the rules governing the carrying contract shall not be derogated."

Another question submitted, "Ought the damages in cases of collision to constitute a complete reparation for the damage suffered?" was settled as follows: "Yes; in conformity with common law."

The question, "Should actions for damage by collision be subject to the necessity of a protest or any other preliminary formality?" was answered in the negative.

Discussion was had on the proposition to limit the time within which actions for collisions may be brought, and it was decided to set the limit at two years, leaving the reservations for special cases for a further conference.

The question as to jurisdiction, procedure, etc., was found to be in too primitive a state of examination to be voted upon and was postponed, though the debates were of the greatest interest. Finally, the liability of ship owners was reached, and here the divergence of opinion was the greatest, the entire continent being opposed to the English system and the proposition of maintaining that system made by the English committee. The conference will meet in London next year.

### Buffalo Elevator Situation.

Buffalo, Oct. 19.—A Cleveland vessel owner made inquiry of a Buffalo correspondent, a few days ago, regarding railroad interests connected with the elevators. He wanted information regarding the several big elevators, as he said he was expecting delays in the grain trade this fall. The answer made to this Cleveland owner will probably be of general interest throughout the lakes. Here it is:

"The New York Central Railroad controls the City elevator; the Erie road controls the Erie elevator; the Connecting Terminal elevator is controlled by the West Shore; the Dakota elevators by the Lehigh Valley; and the Union elevator by the Lackawanna. The railroads in contracting for grain do it at rates that include the Buffalo charges, therefore there is no direct charge against the grain for elevating. Certain other elevators, namely, the Great Northern, Export, Coatsworth and Electric, are owned or operated by large grain dealers and shippers who handle their own grain. All the other elevators that have railroad connection are in a little pool and charge a quarter of a cent for elevating and storing any part of ten days, and delivering to cars or canal boats. This little pool is a comparatively new combination. It is getting very little grain. The bulk of the business is done by railroad elevators that have cargoes consigned direct, and the bill of lading is usually made in such form that it implies a contract to deliver the cargo into the particular elevator named, and there seems to be no relief for the vessel except to wait until her turn comes. A good deal of delay has already been experienced at some of the elevators, notably the City and Coatsworth, and the condition will very probably soon be much worse."

The last chance to visit the Omaha exposition at low excursion rates will be Oct. 25, on which date there are special rates via the Nickel Plate road. Ask agents. 232, Oct. 22.

## Trade Notes.

The United States government has just awarded to the Knowles Steam Pump Works of 93 Liberty street, New York, a contract for the entire equipment of pumps for refitting Admiral Farragut's old flagship, the Hartford, now being refitted at the Mare Island navy yard, San Francisco.

The fifth edition of "Soft Coal Burning," by C. M. Higginson, is just from press. Mr. Higginson is an acknowledged expert on combustion and the present edition has been rewritten and enlarged from the fourth edition. Published by the Railway Master Mechanic, 816 The Rookery, Chicago.

The Berlin Iron Bridge Co., East Berlin, Conn., is erecting the extension of the foundry for the Benjamin Atha & Illingworth Co. at Harrison, N. J. This extension is 51 feet wide and 152 feet long. The framework is of steel throughout. The sides are covered with corrugated iron on steel purlins, and are arranged for suitable doors and windows. The side columns support a 30-ton electric crane, having a span of 46 feet. The roof construction is of steel trusses and purlins arranged with openings in the roof for skylights.

Active missionary work in the field of domestic illumination is almost as necessary today as when the incandescent electric lamp was first introduced, and relaxation of educational effort is indubitably followed by an increase in the gas opposition and a consequent decrease in the use of the electric lamp. The incandescent gas mantle became popular immediately after its introduction, and not until the public had purchased its experience was it willing again to listen to exact information regarding the real significance of the mantle. The General Electric Co., as the parent of electrical illumination, has done much to give accurate information to the public, expending considerable sums of money in test and experiment and publishing the results at its own expense. That company has just issued a small pamphlet on the "Depreciation of Candle Power of Welsbach Mantles," giving the result of interesting tests made both in mantles and electric incandescent lamps. It contains information of use to every electric light station manager, as well as to the general public, and will be sent by the General Electric Co., New York, to anyone interested, on application.

### Tow Lines From a Tug.

How strong am I?  
Ask yonder chains and hawsers broken,  
Ruined in the junk pile there they lie.  
Vilely cursed the skipper of the steamer,  
Ere I had a chance to try.  
Yelled he loud with angry gesture,  
"D— that tug!"  
"Go slow!"  
Oh! I was only turning over,  
Upon my bitts, I've had no show.  
Listed down, my lee rail under,  
Down on my beam ends I'll heel;  
E'en an eighteen-inch I'll tear asunder,  
Rolling down, my strength they'll feel.

For a comfortable trip to New York take Pennsylvania No. 6, which leaves Union station daily at 1:40 p. m., and from Euclid avenue 1:50 p. m., arriving New York 7:43 next morning. Pullman's very best sleepers run through on this train without change. Supper is served in dining car. Note that the train stops at Euclid avenue station, saving the tedious ride down town to those living in the eastern part of the city. Phone main 1263 or east 513 for space and full information.

It is announced from the New York office of Fall River Line that beginning Monday, Oct. 24, 1898, the leaving time of the Norwich Line steamers from New York will be changed from 6 to 5:30 p. m.

The Omaha exposition is now at its best, and those desiring to enjoy the privileges afforded by such exhibits can materially add to the pleasures of such a trip by seeing that their tickets read via the Nickel Plate road. Oct. 25 is the last day on which low excursion rates will be in effect. 230, Oct. 22.

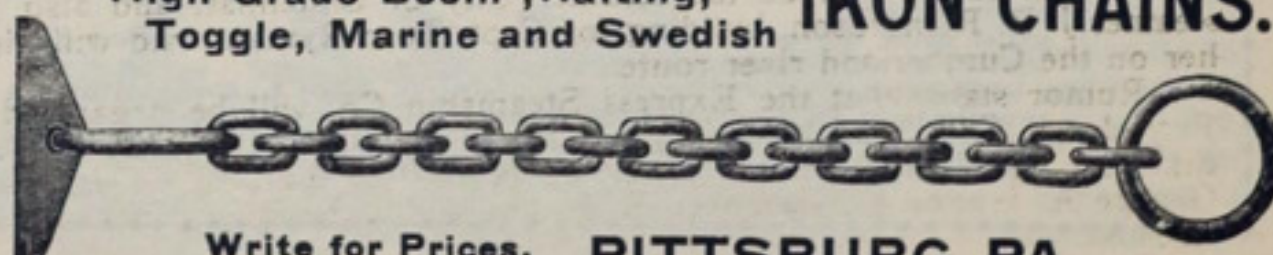
UNITED States Marshal's Sale.—Northern District of Ohio. By virtue of an Order of Sale issued out of the United States District Court for the Northern District of Ohio, on the 18th day of October, 1898, notice is hereby given that I will sell by public auction, for cash on Wednesday, the 26th day of October, 1898, at 2 o'clock p. m., at the front door of the Government building in the city of Toledo, Ohio, the Steamer "A. L. Hopkins," her engines, boilers, machinery, boats, tackle, apparel, appurtenances, and furniture, as she now lies at the C. & P. Slip, Old River bed, Cleveland, Ohio.

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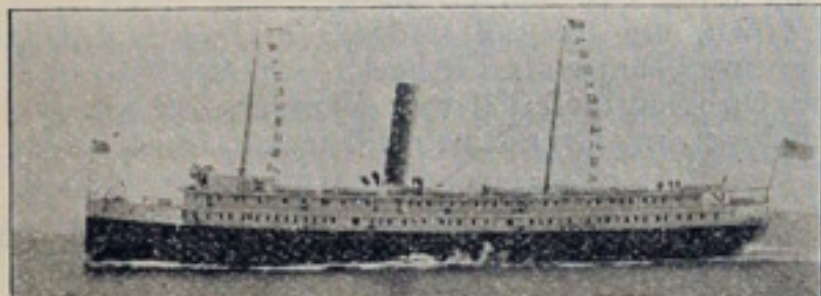
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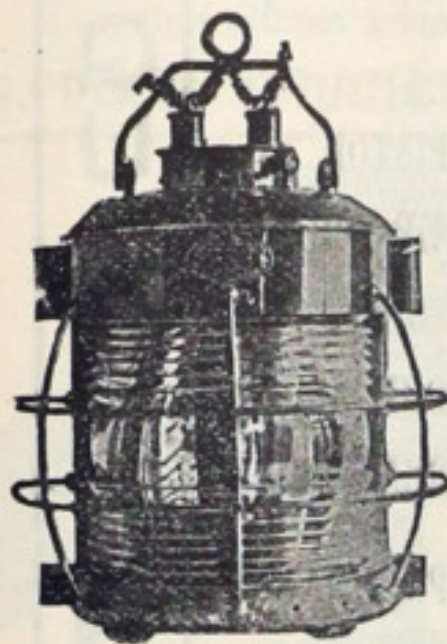
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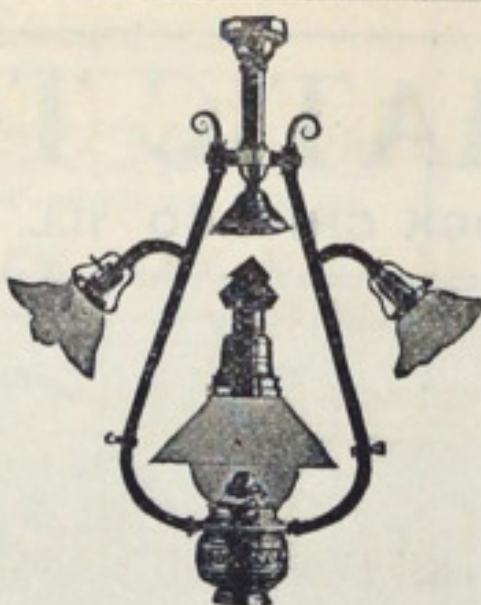


# MARINE LAMPS



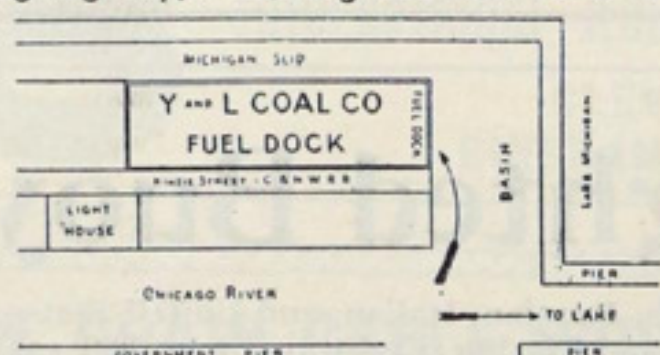
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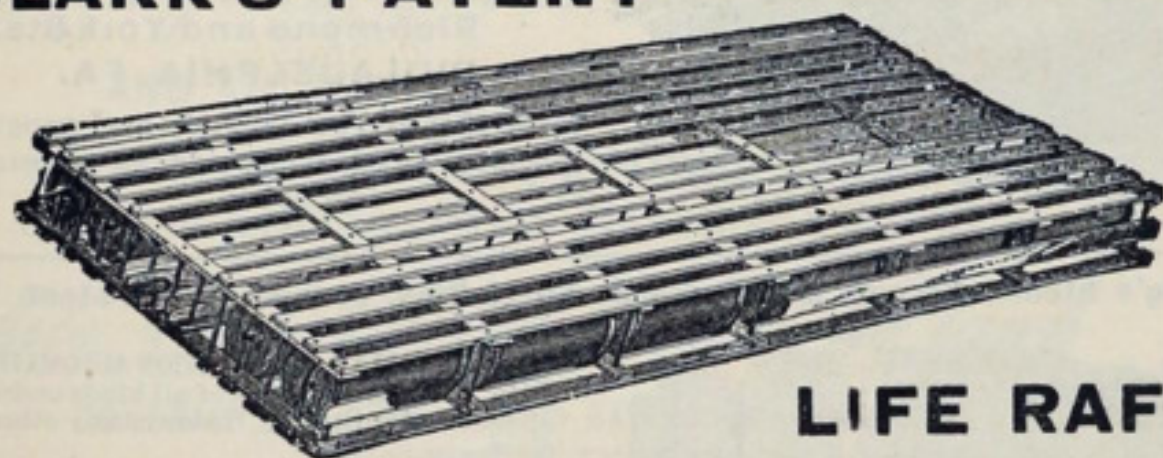
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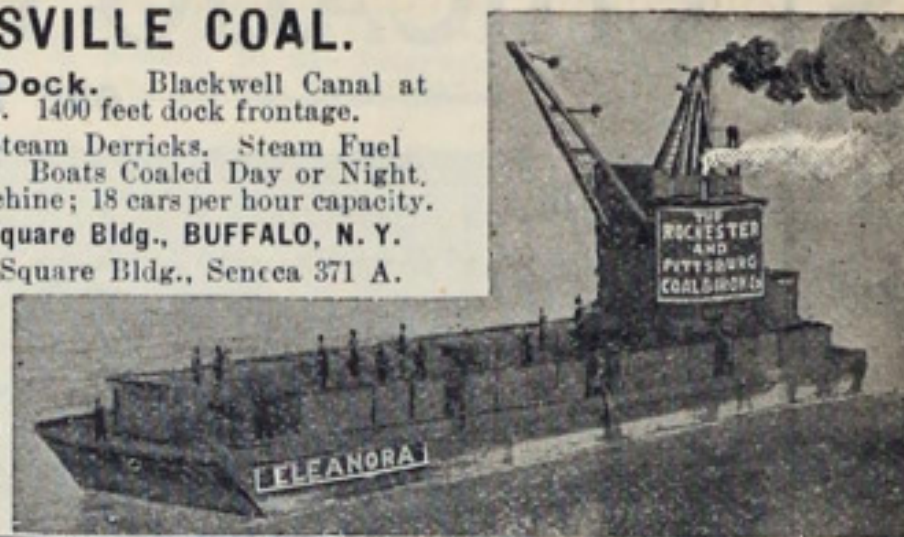
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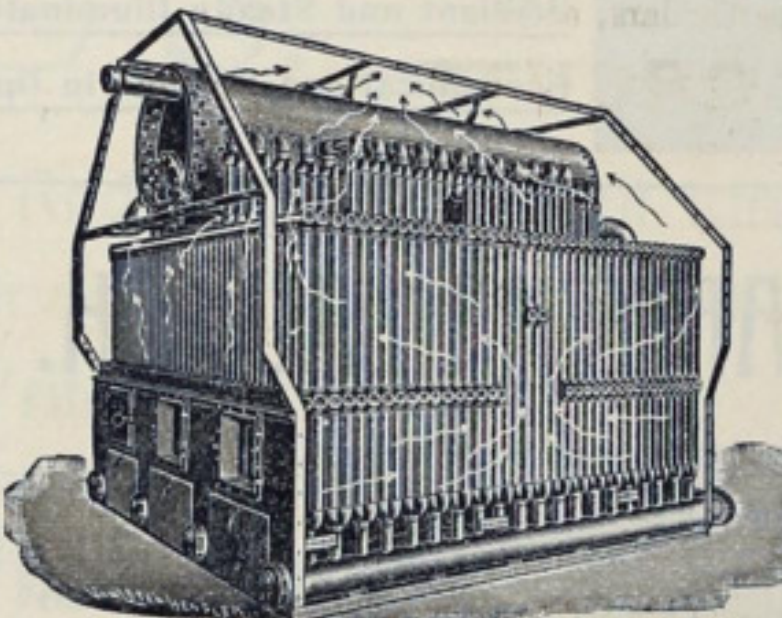
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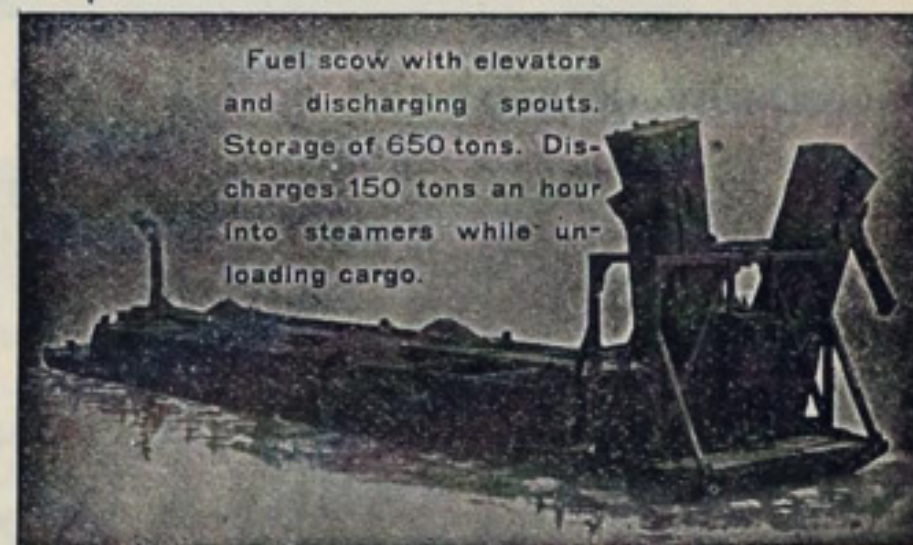
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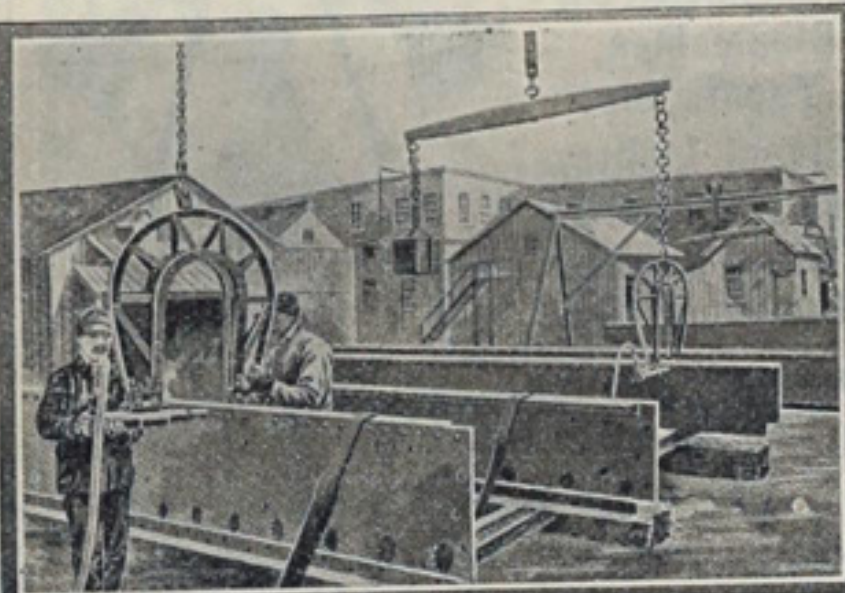
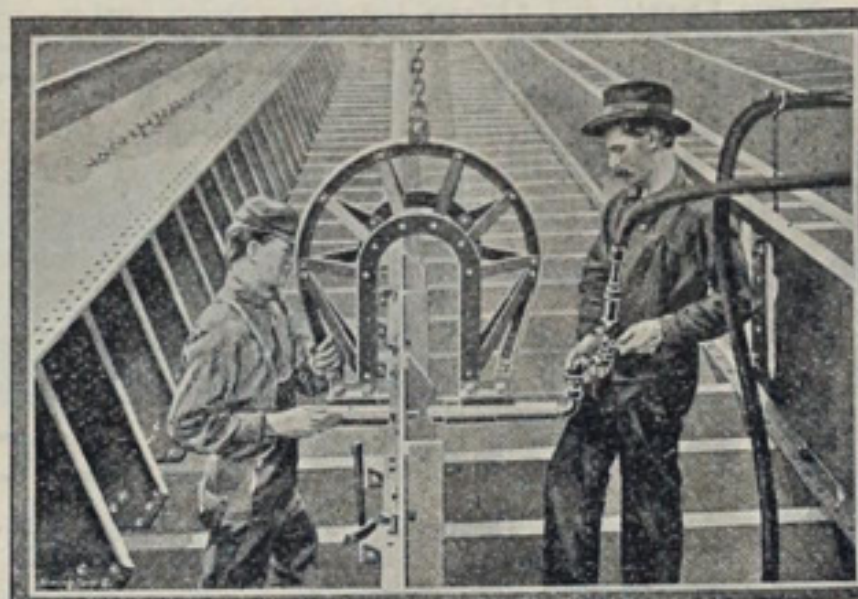
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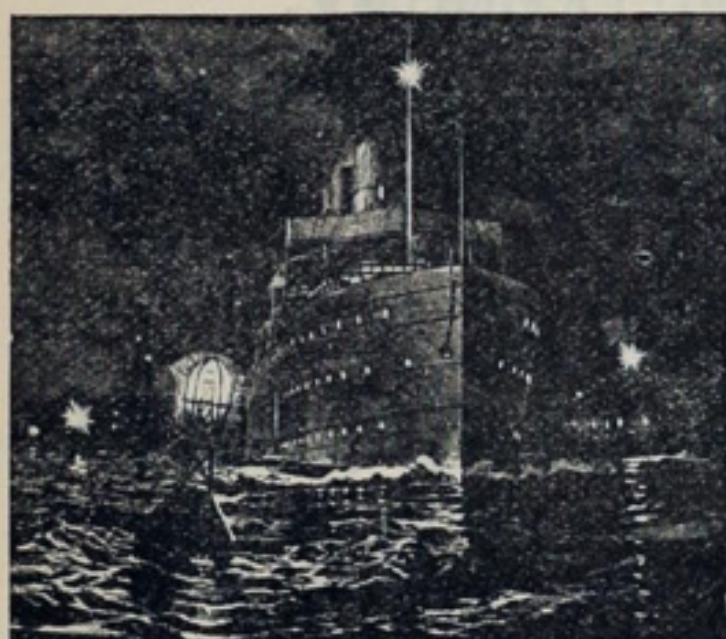
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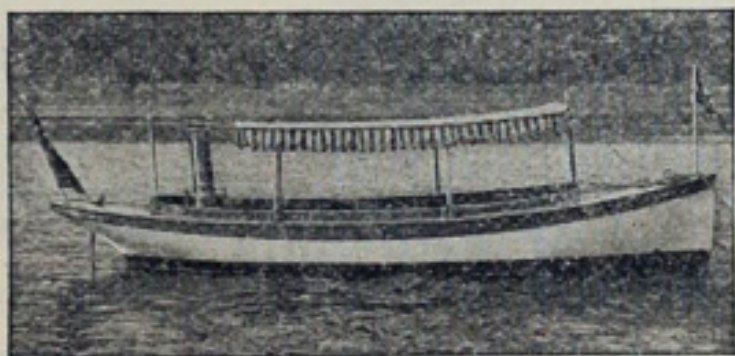
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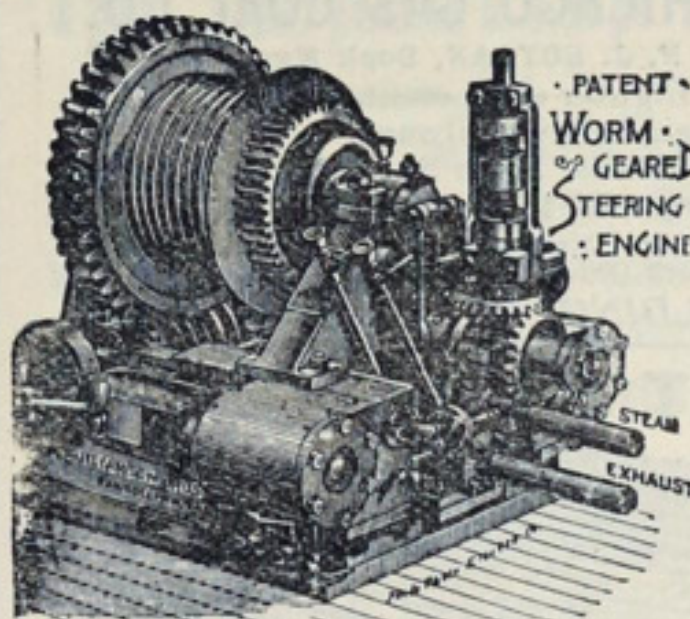
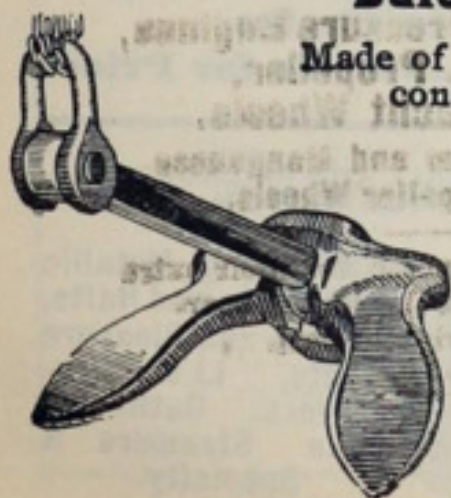
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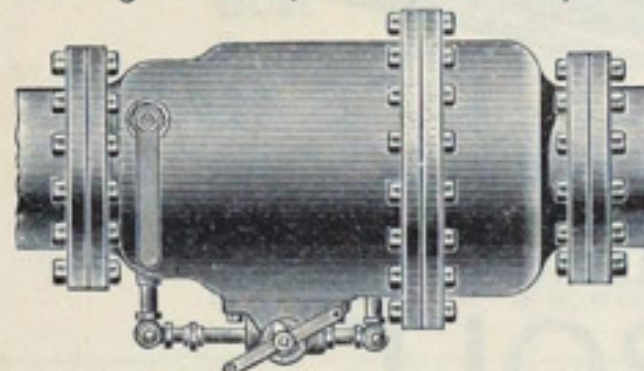
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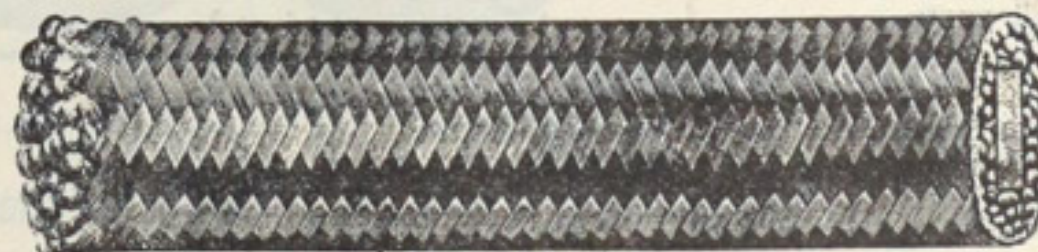
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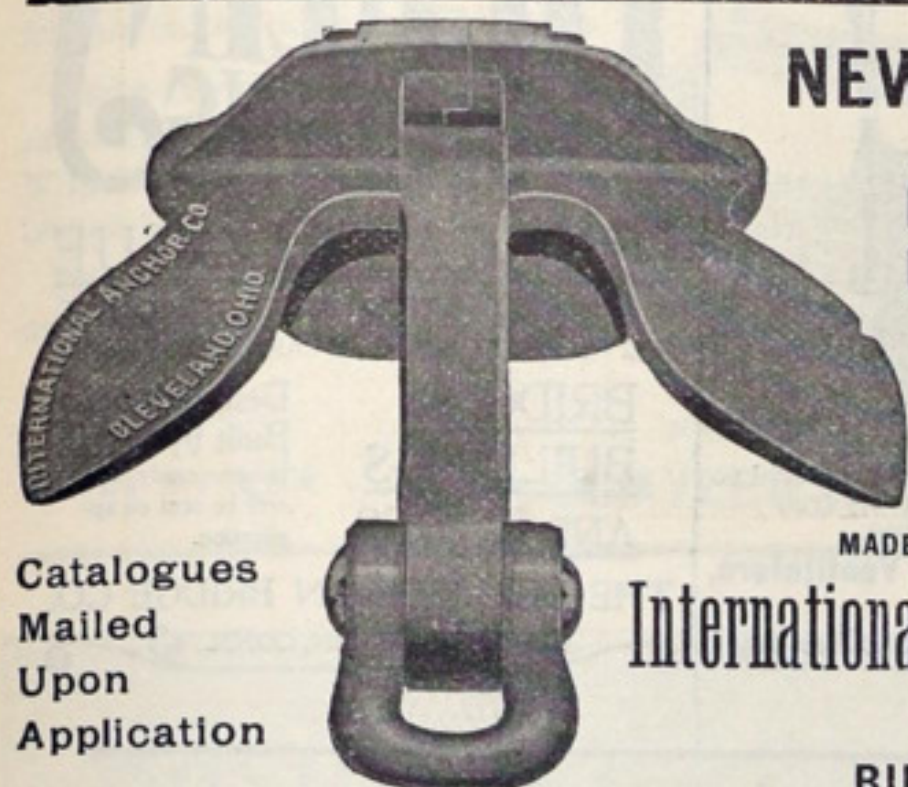
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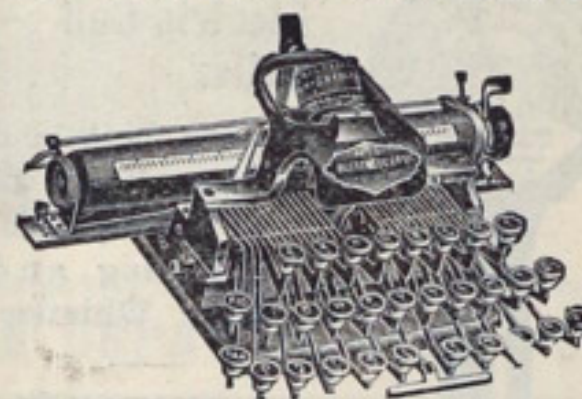
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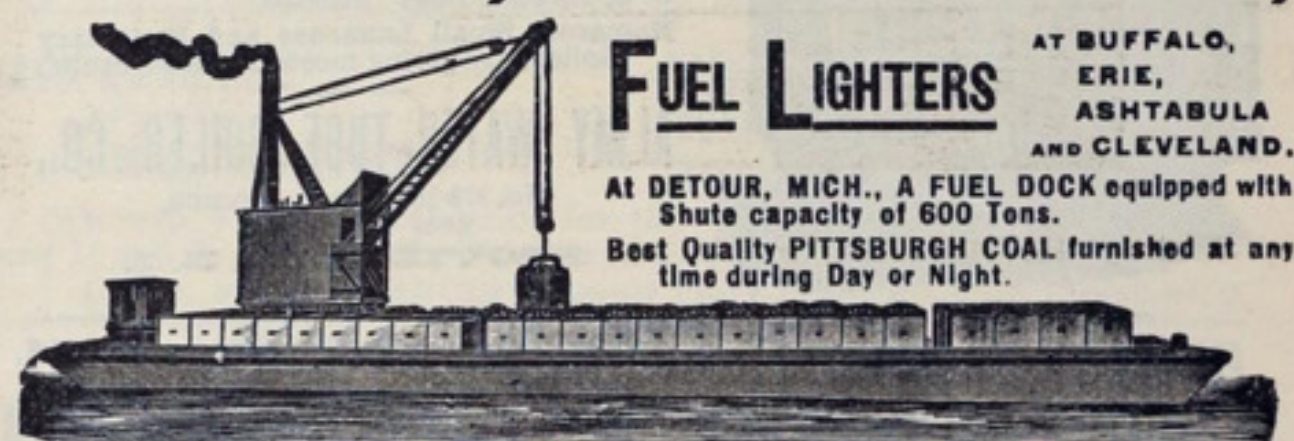
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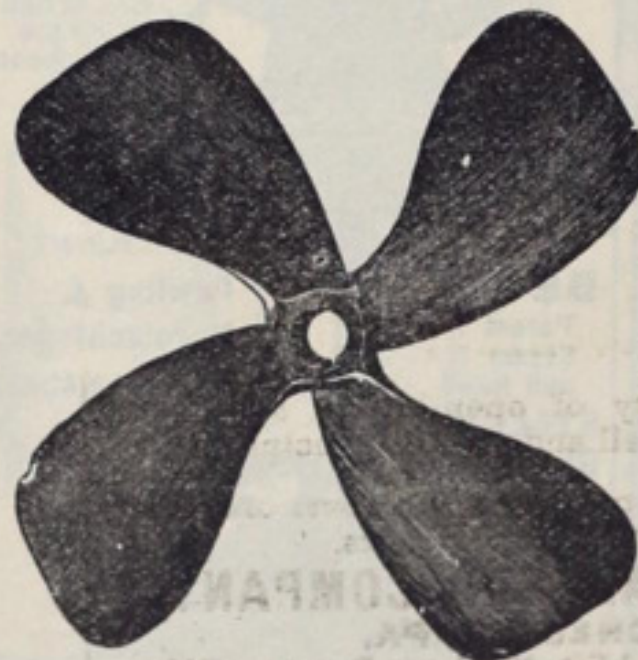
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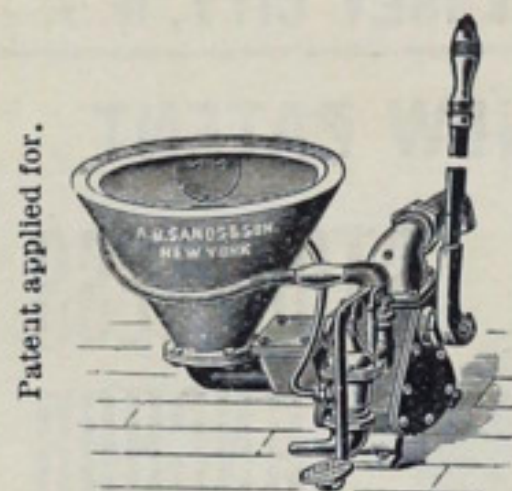
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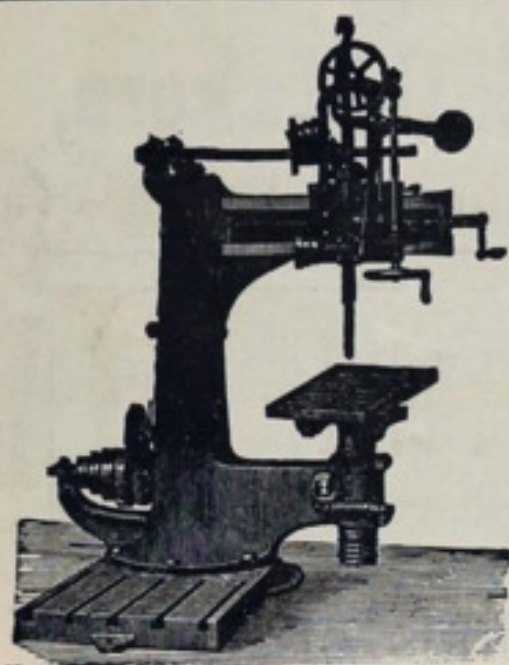
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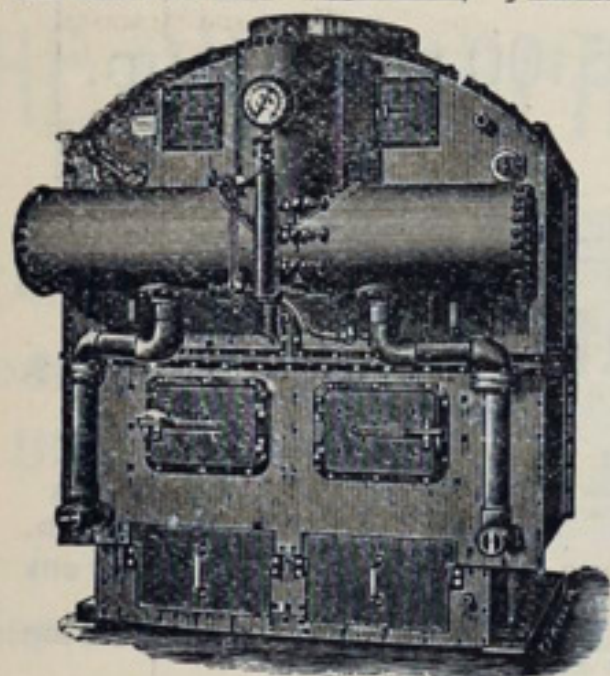
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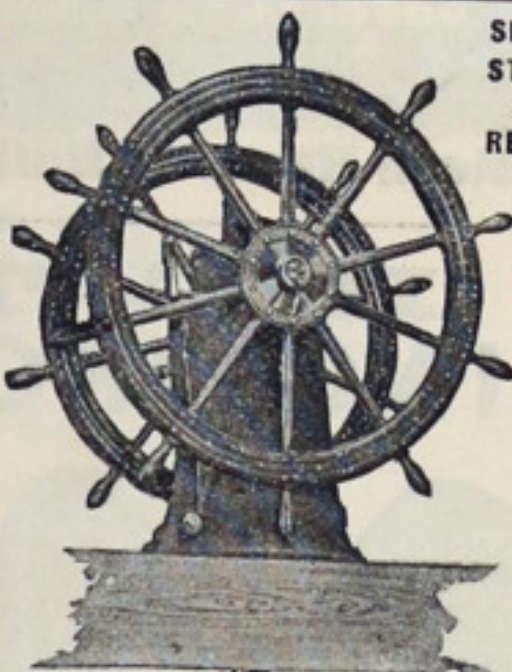
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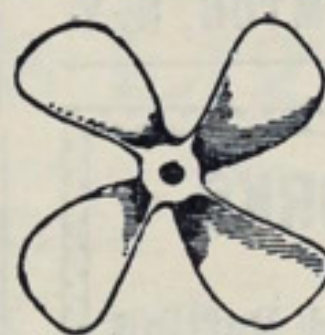
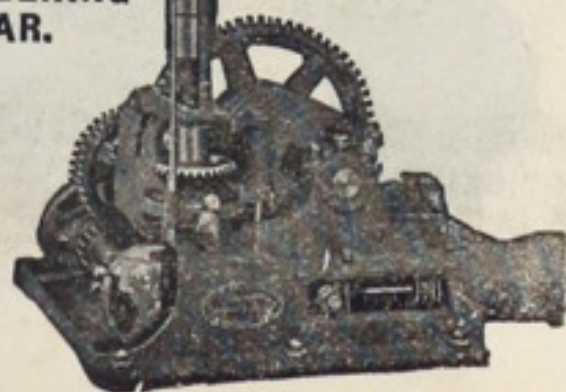


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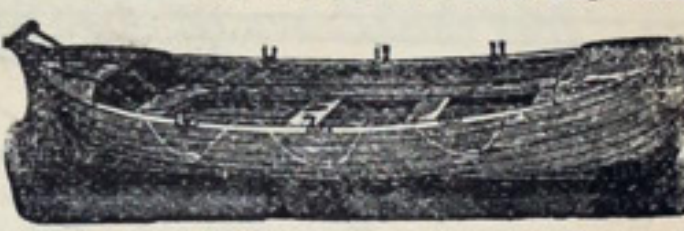
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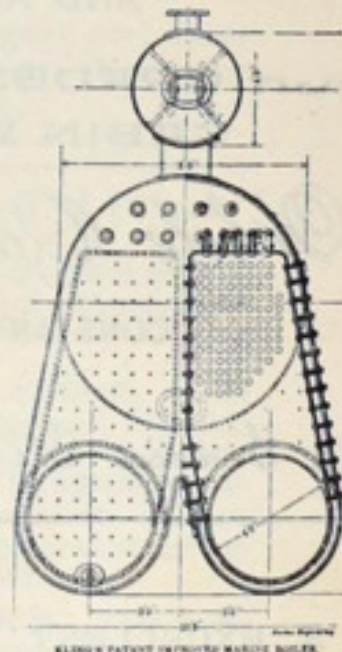
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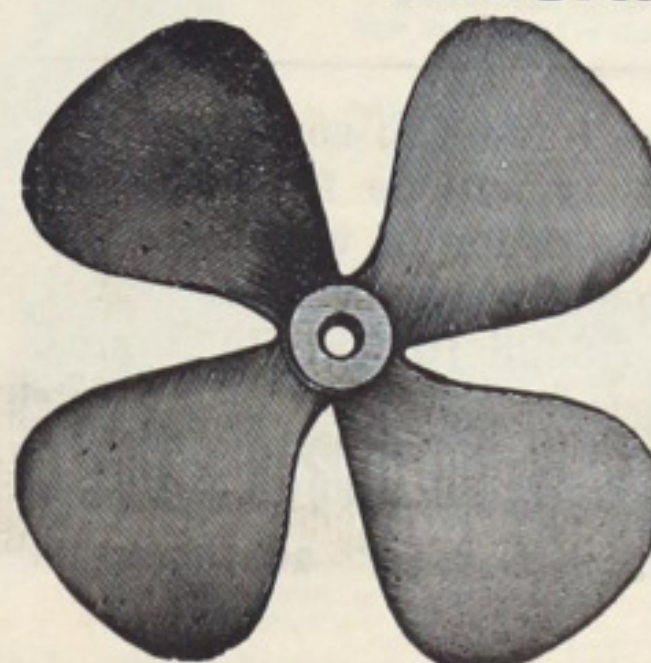
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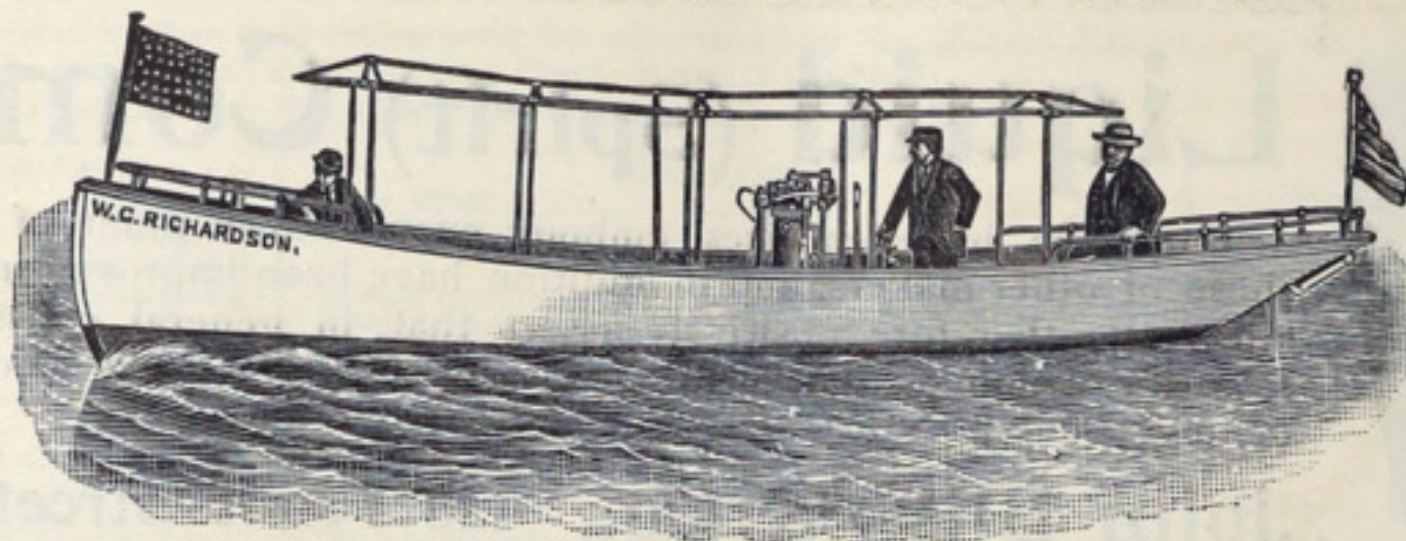


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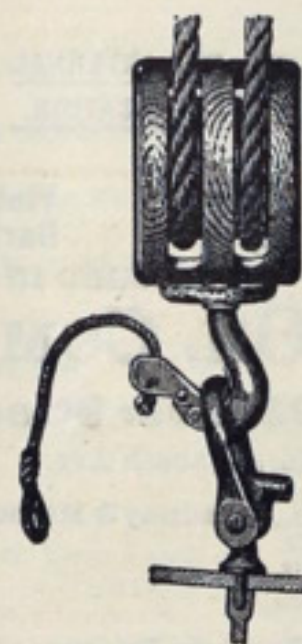
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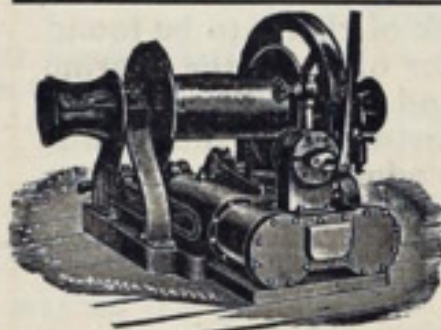
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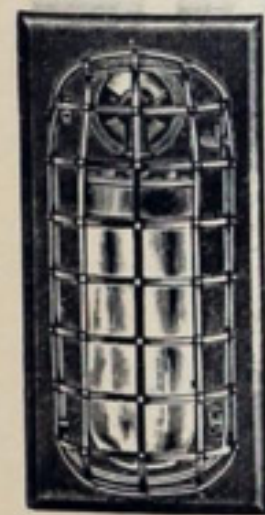
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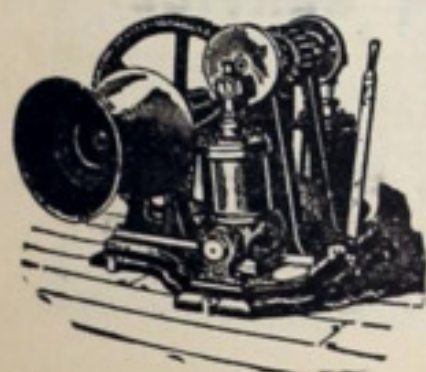
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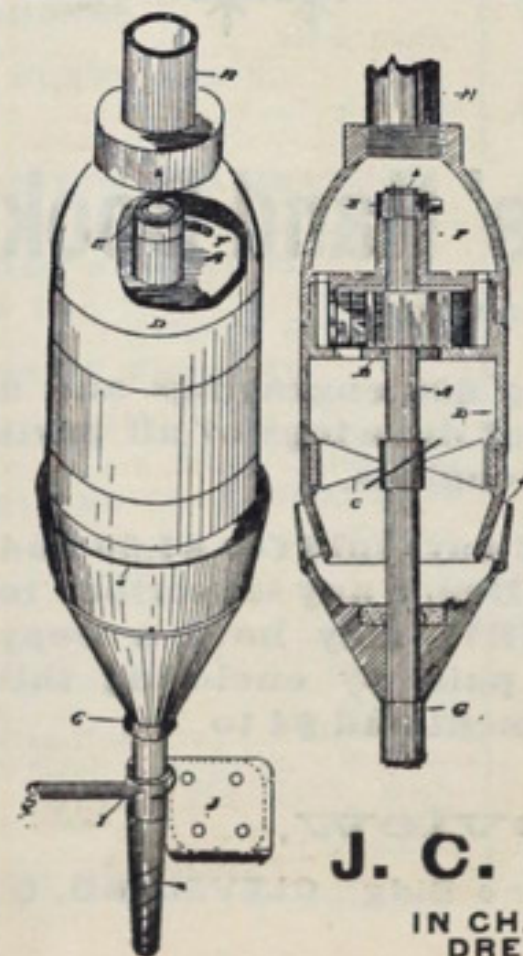
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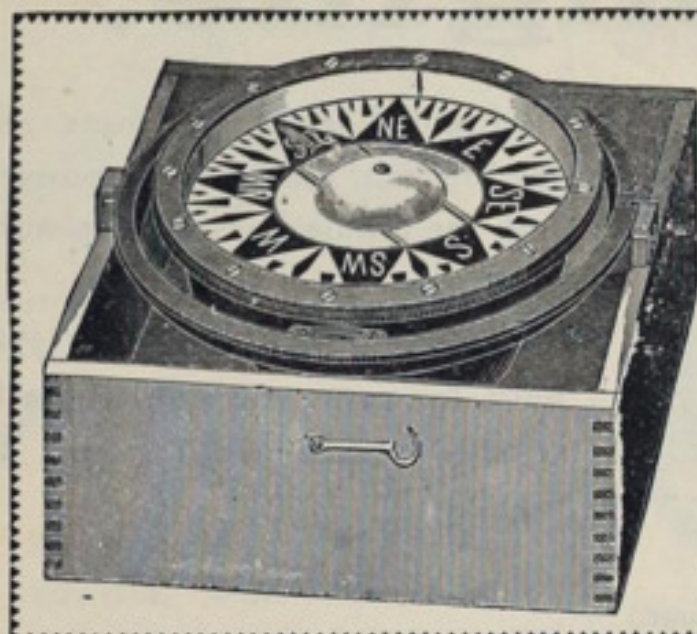
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One of them, built of oak in 1888, is of the following dimensions: Length over all, 66 ft.; on water line, 54 ft.; breadth, 12 ft.; depth, 6 ft. 4 in.; draft, forward, 2 ft.; draft, aft, 5 ft.; gross tonnage, 21.46; net tonnage, 10.73; bunker capacity, 5½ to 6 tons; speed, 12 miles; passenger accommodations, 9 berths. Machinery—Compound engines of 8 and 15 inches by 10 inches stroke; pressure, 200 lbs.; boiler, pipe (Smith's Patent), built in 1891; length of boiler, 6 ft.; width, 5 ft. 6 in.; height, 6 ft.; fuel consumption per 24 hours, 3 tons. Outfit—Two boats, capstan, two anchors, 20 life preservers, 12 camp chairs, and everything required by law. Cabin is built of cherry, and contains washstand and water-closet. Pilot house also of cherry, having berth for captain. Large galley with stove and all necessary racks, shelves, etc. Two spars and rigging.

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also offered at a bargain, are as follows: Built of oak in 1881; length over all, 74 ft.; on water line, 63 ft. 7 in.; breadth, 18 ft.; depth, 8 ft. 7 in.; draft, forward, 4 ft. 3 in.; draft, aft, 6 ft. 1½ in.; gross tonnage, 41.74; net tonnage, 28.97; bunker capacity, 7 tons; speed, 10 miles; passenger accommodations, 36. Machinery—Fore-and-aft compound engine with cylinders of 10 and 15 inches diameter by 10 inches stroke; boiler, marine tubular (Desotell & Hutton), 6 feet 6 inches long and 4 feet diameter; fuel consumption every 24 hours, 2½ tons. Outfit—Two boats, two anchors, one chain, one sideboard, 19 chairs and stools, 34 life preservers, four awnings, two sidelights, one headlight and one sternlight, two brass ventilators, one pilot house compass, one tell-tale compass, two spars and necessary rigging; also engine tools, bed and table linen, curtains, etc.

For prices address "Steam Yachts," Marine Review, Cleveland.



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# Steel Boiler Tubes?

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SOLID ROUND BAR—NO LAPS, SEAMS OR WELDS.

Cold Drawn Finish and Density of Metal prevent pitting and corroding.  
Only Highest Grade of Material used. Sulphur and Phosphorus guaranteed not to exceed .025%.  
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Tubes do not Split or Crack when re-rolled in Tube Sheet.

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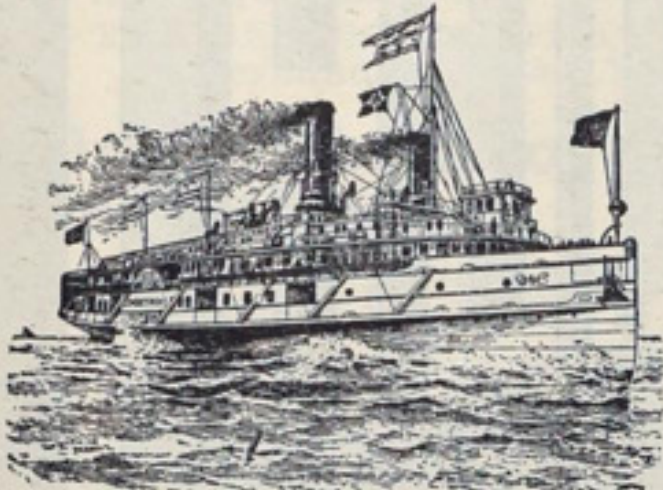
SEND US SAMPLE ORDER AND VERIFY ABOVE STATEMENTS.

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## RAPID FUELING DOCKS, DETROIT RIVER.

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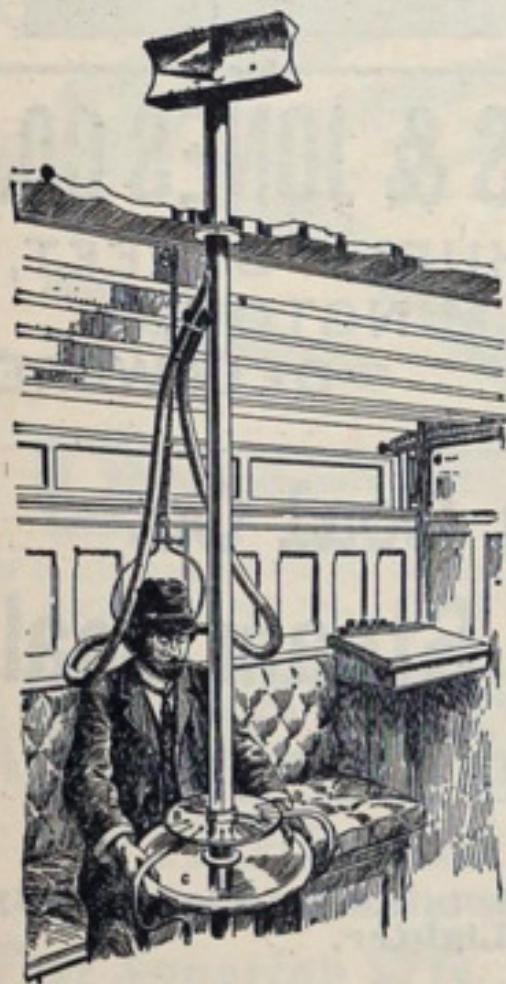
Below Routes of Passenger and Car Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

**BEST STEAM COAL.**

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.

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AN AID TO NAVIGATION  
that prevents grounding  
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## THE EOPHONE,

MANUFACTURED AND INSTALLED  
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**EOPHONE CO.**  
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It accurately locates the place from whence the sound comes, and shows its bearing on a dumb compass. It has been adopted by U. S. Revenue Cutter and Light House service, has favorable reports of board of officers of U. S. Navy and is in practical service on many coast steamers. \* \* \* \* \*

This instrument will prove especially valuable in lake navigation on account of the frequency of fogs and thick weather.

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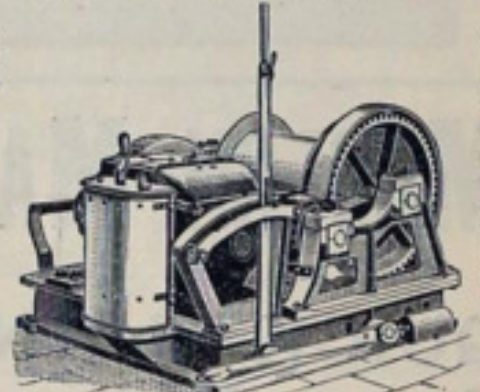
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"The Little Red Book" of appointments of captains and engineers for 1898 includes names of owners, captains and engineers of 1,000 of the principal lake vessels. It is vest-pocket size, and the price is \$1. No one interested in marine business or supplying the marine trade can afford to be without it. Marine Review, 409 Perry-Payne building, Cleveland, O.

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DOCK BELOW U.S. 500 LOCKS,

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ONE TRAVELING MCMYLER DERRICK

WITH CLAM-SHELL BUCKET,

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PAUL H. MC ELEVY, MANAGER

STEAMERS CAN GET FUEL FROM POCKETS, each of which contains  
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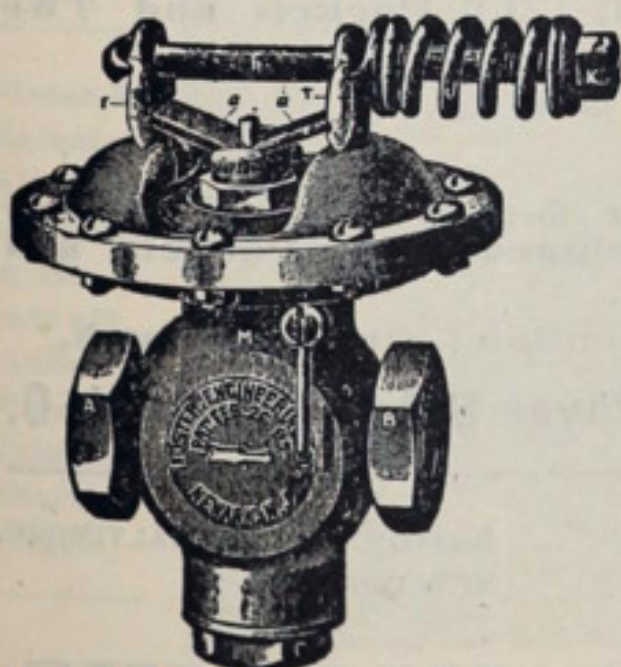
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For fueling vessels I have the management and control of the Osborne-Saeger pockets, located next to Cleveland Ship Bldg. Co.'s yard. Steamers coaled on short notice.

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This lighter is equipped with a clam shell bucket. Steamers fueled in any part of harbor or under the breakwater.



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### Pressure Regulator.

The Experimental Board of the Bureau of Steam Engineering of the U. S. Navy, after recent tests, report that it is:

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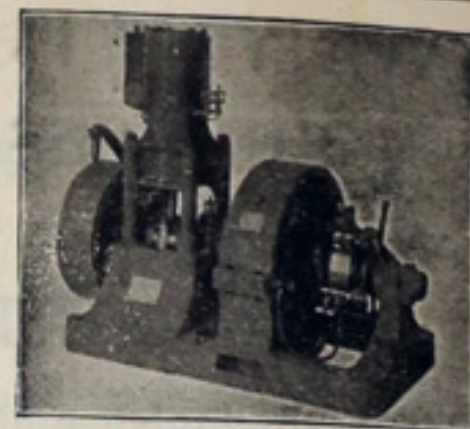
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ESPECIALLY ADAPTED FOR  
CONTRACTORS, QUARRIES, SHOVELS,  
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CANDLE POWER FROM KEROSENE OIL.  
PORTABLE, SELF-CONTAINED, AUTOMATIC.  
UNAFFFECTED BY WEATHER,  
400 RAILROADS  
AND OVER 500 CONTRACTORS NOW USE WELLS LIGHT.

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DELAWARE.

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IN THE ENGINES OF THE

U. S. Battleship Oregon

WAS MANUFACTURED BY

**The Bethlehem Iron Company,**

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**THE CRUMLISH FORGE**

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Two Docks at Detour (formerly known as the Anthony  
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MARINE ENGINES,  
PROPELLER WHEELS,  
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MARINE REPAIRS.

320 ATWATER STREET,  
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After 20,000 miles of almost continuous steaming since going into commission, including her remarkable trip from San Francisco to Key West, the U. S. Gunboat MARIETTA, equipped with Babcock & Wilcox water tube boilers, ordered the following repair parts:

"T. B. S.—W. D. L.

NAVY DEPARTMENT,  
Bureau of Supplies and Accounts,  
Washington, D. C.

In reply refer to No. 29181.

Gentlemen:

June 10, 1898.

1. Please forward to the Commanding Officer, U. S. S. 'MARIETTA', Key West, Fla., 8 fire bricks, 4 rights and 4 lefts, No. R, 3440, Babcock & Wilcox boilers, to replace broken bricks between furnace doors.
2. Your bill for these articles should be sent to the same officer and should refer to Steam Engineer-  
ing Requisition dated June 1, 1898.

THE BABCOCK & WILCOX CO.,  
29 Cortlandt St., New York."

Respectfully,

(Sig.) EDWIN STEWART, Paymaster General,  
U. S. N.

On her long voyage the MARIETTA was not detained an instant on account of boilers.

THE BABCOCK & WILCOX CO., WATER TUBE BOILERS, 29 Cortlandt St., New York.



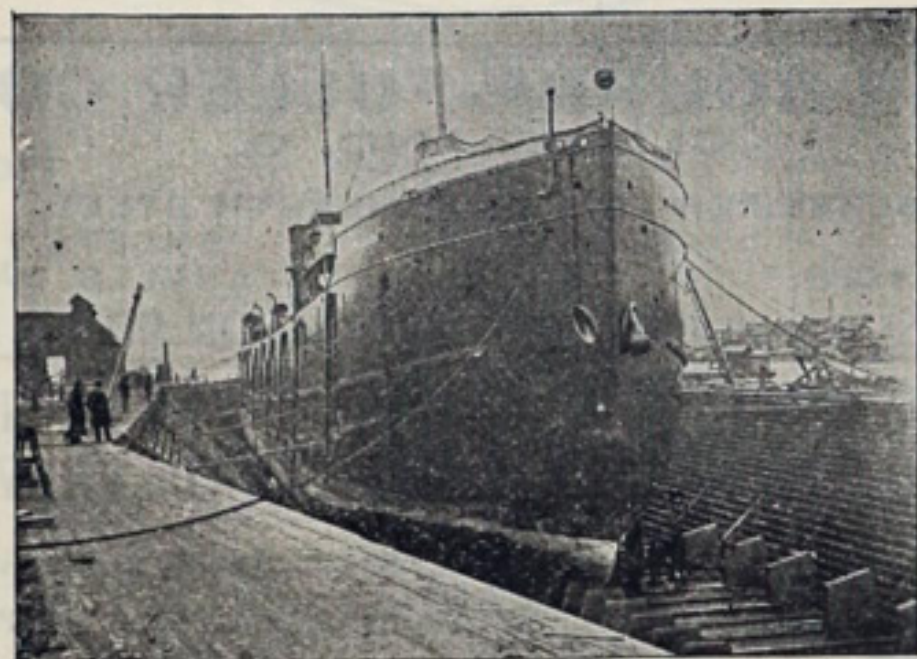
IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT.  
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Of all classes built on the Shortest Possible Notice at our yards at  
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Plates &  
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Always  
on hand  
to Re-  
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Ships in  
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Best  
Quality  
of Oak  
instock  
for Re-  
pairing  
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of all  
Classes.

#### SIZE OF DOCK.

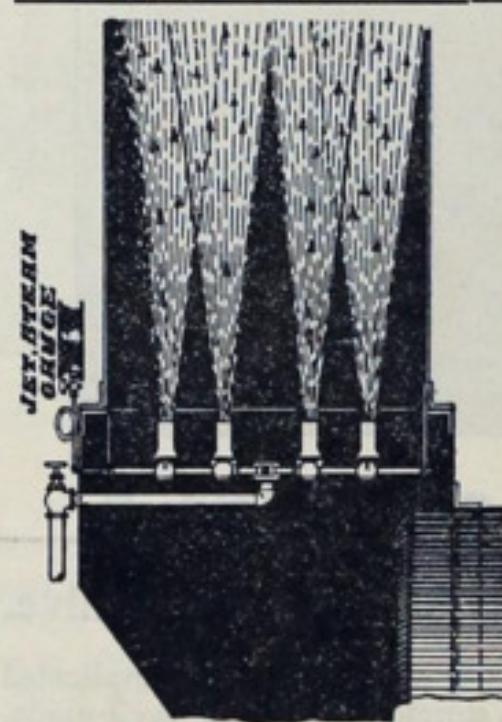
Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in
Breadth, Top.....90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom.....52 "	Depth over Sills.....18 "

### LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

### SUPERIOR, WIS.

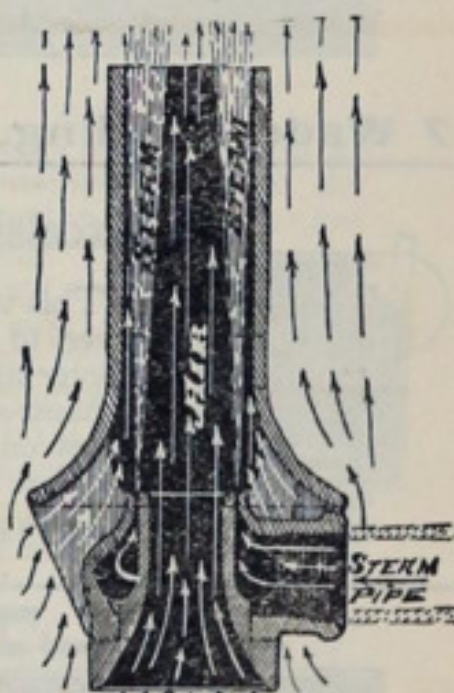
A number of Propeller Wheels in stock at Dry Dock,



## THE IMPROVED ANNULAR STEAM JET.

FOR INDUCED DRAFT.

POWERFUL.  
ECONOMICAL.  
15% TO 25%  
INCREASE  
IN POWER.



Cut on the right shows a section of Jet Castings, which are attached to Spider in stack, as shown by cut on the left.

Requires No Attention.

Always Ready for Use at a Moment's Notice.

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CHICAGO OFFICE:  
Telephone 273. 240 South Water St.

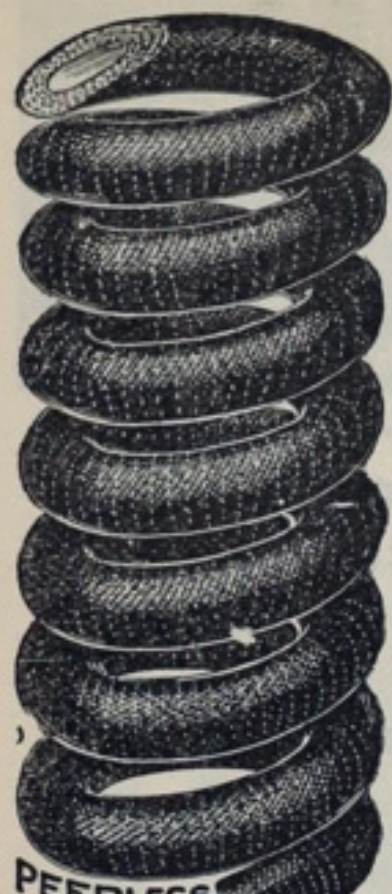
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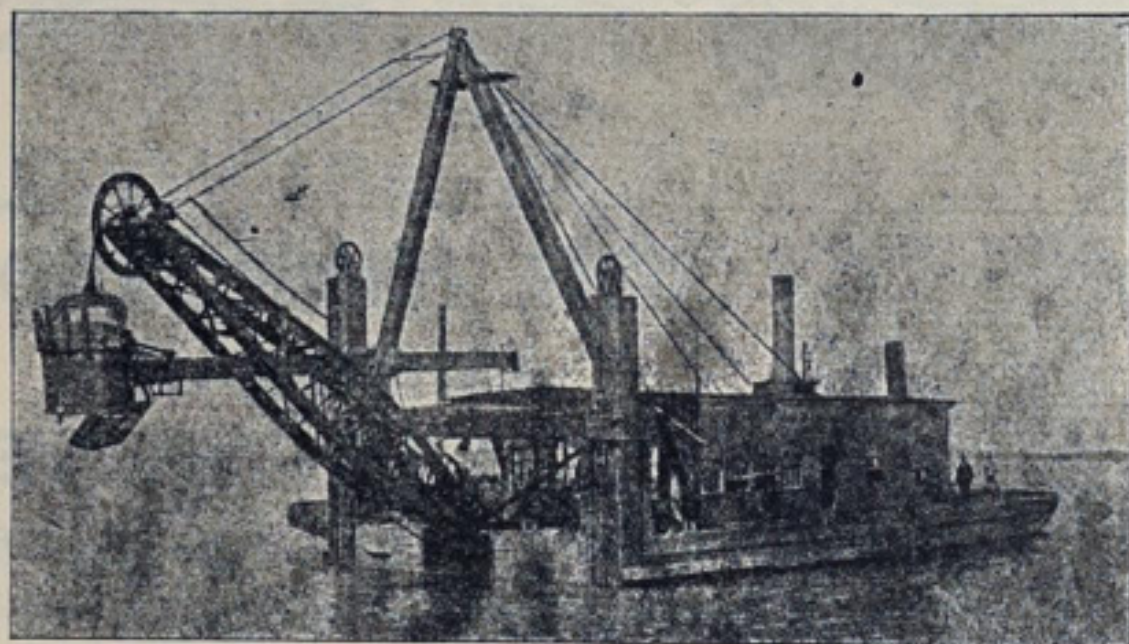
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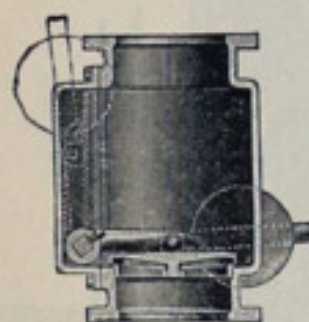
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This valve has no dash pots, springs, guides or complicated levers to get out of order. It is simple, reliable and well-made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It is noiseless and free from any complicated attachments.

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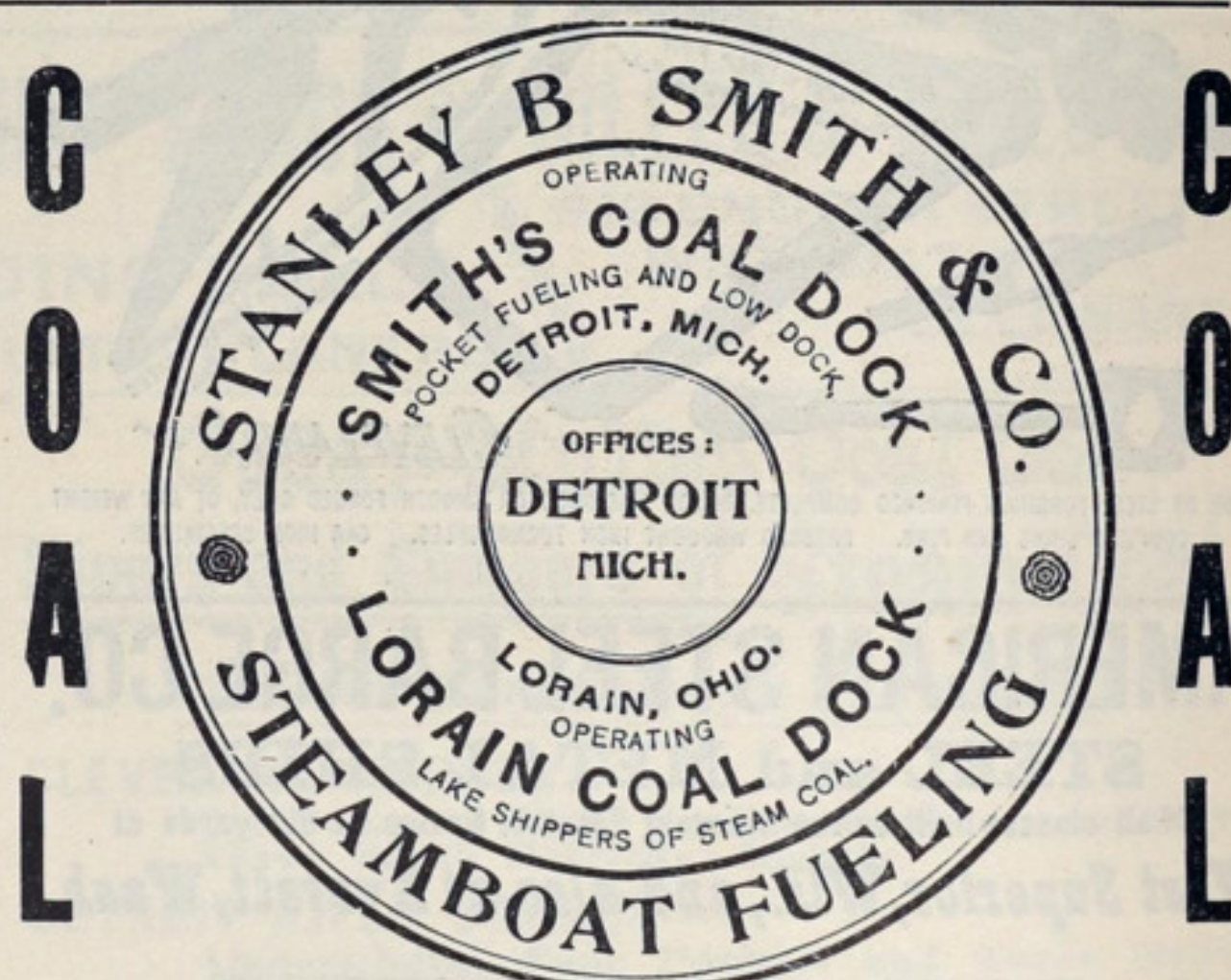


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INGOTS, CASTINGS, WIRE RODS, SHEETS, ETC.  
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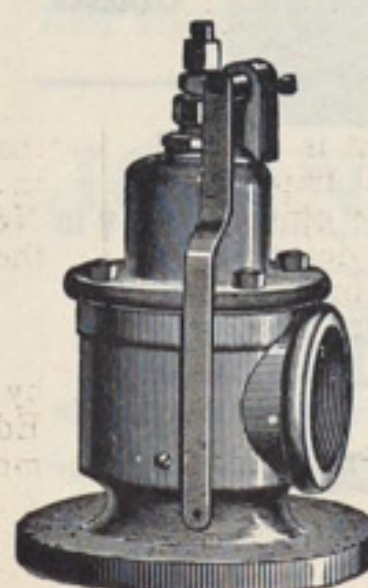
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